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HISTORY OF THE MANUAL TRAINING SCHOOL OF WASHINGTON UNIVERSITY

(ST. LOUIS MANUAL TRAINING SCHOOL)

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PREFACE.

The records of the first manual-training high school in the world are still buried in the archives of Washington University, and yet this institution was of incalculable significance for the extension and influence of manual training.¹ This chronicle is not intended to be considered an attempt to trace elaborately the history of manual education, although that, too, is apparently a very murky field. The scope of the effort is far narrower. From beginning to end it consists of an extended historical comment on the endeavors of a small group of men to solve a problem precipitated by the industrial revolution—an economic upheaval which quickly brought substitution of machine precision for physical dexterity and which hastened the decay of the apprentice system. The purpose of its writing will, however, be accomplished if it presents to the student of the history of education and to the general reader a clear and comprehensive idea of the historical significance of the Manual Training School of Washington University.

The subject will be discussed under the following heads: The founding of the Manual Training School of Washington University; the history of the school from its opening, June 7, 1880, to its consolidation with Smith Academy, February 5, 1915; the internal economy of the school as reflected in the disciplinary rules and regulations, in the student activities, in the alumni interests, and in the selection of the faculty; and as concluding chapters an examination of the gradual evolution of the idea of a manual training high school and a hasty sketch of its influence upon American education. In these widely differing subjects it has been a difficult task to hold to a single, steadily maintained point of view. Yet one theme may fairly be said to run through all the following pages: The intention to present historically the rise of the so-called Russian system of manual training as exhibited in a chronicle of its most important proponent. The Russian system endeavored to teach the handicrafts after the fashion of contemporary education; the fundamental tool

¹ I am indebted to the courtesy of Chancellor Frederick A. Hall, of Washington University, for the opportunity to study these documents. Substantial assistance has also been given by Mr. Edward C. Elliot, Mr. Charles F. White, Mr. Willis R. Grocott, and other former instructors of the St. Louis Manual Training School.

To Prof. Archer Taylor, of Washington University, the author feels an especial debt of gratitude for unfailing interest and generous aid.

processes were abstracted from their natural setting and were arbitrarily combined in a series of exercises calculated to give the student "continuous mental discipline." In a word, the Russian system was the application of the fiction of formal discipline to craft instruction. Two ends were striven for—education for industrial efficiency and training for intellectual power. Perhaps nowhere were these dual purposes more concisely phrased than in the famous motto which was carved above the door of the old school:

Hail to the skillful, cunning hand!

Hail to the cultured mind!

Contending for the world's command,

Here let them be combined.

St. Louis, Mo., December 9, 1922.

CHARLES P. COATES.

HISTORY OF THE MANUAL TRAINING SCHOOL OF WASHINGTON UNIVERSITY.

(ST. LOUIS MANUAL TRAINING SCHOOL.)

Chapter I.

FOUNDING OF THE MANUAL TRAINING SCHOOL OF WASHINGTON UNIVERSITY.

Instruction in the manual arts has perhaps the longest history of all the branches of education. The endeavors to solve the problems of material, method, and aims begin with the beginnings of history and have not yet attained to a generally accepted solution. The history of these endeavors may, notwithstanding the centuries over which they extend, be readily divided into an earlier age, when the aim was primarily mastery of the craft or crafts, and a later, brief period when the stress was for a time laid on the educative value of the material. In the following pages this later episode will be reviewed with special regard to the St. Louis Manual Training School, the leader in the new doctrine.

The oldest form of craft instruction is, of course, apprenticeship in one form or another. The extent to which the earlier types conformed to the legal definition of apprenticeship need not greatly concern us. Under this head may be conveniently grouped together all vocational instruction given man to man, with little or no selection of the material for its educational value. A boy learning a handicraft turned in any community or age to someone favorably known for his accomplishments. It has been suggested that the Babylonians were familiar with this form of education, and it must have existed wherever men were skilled and boys wished to learn. After a period of desultory and necessarily unsystematic instruction the boy felt free to set up as a craftsman for himself.

In time new forces, the increasing complexity of the crafts, and the efforts to restrict the number of workers and the quantity of wares, altered the old, haphazard arrangement. Such agencies as these brought about the formation of craft guilds, composed of workers in a particular trade. The change in the relation of the workmen to one another occasioned sooner or later a change in the relation between master and apprentice by which in the craft guild apprenticeship attained a definite form. The apprentice acquired a legal status as regards his employer and instructor. In return for the obligation which he undertook, he was entitled to demand something—a systematic induction into his chosen vocation. Conditions had become more complex; the institution of mastership

and journeymanship came into being. Whether this development was markedly furthered by educational ideals or purposes may be questioned. The result, however, was that a boy entering a handicraft as an apprentice might reasonably expect to become in time a master craftsman. Yet, in practice, apprenticeship did not always work out so successfully. Not all master craftsmen were willing or competent to instruct those in their charge. The guild maintained schools to satisfy the expectations of the apprentice and to insure his learning the fundamentals of reading, writing, and arithmetic, or "whatever is needful for an apprentice." With the breakdown of the guilds and their increasing inability to combat the surreptitious workers, these schools lost their importance. They did not develop into trade schools, for that institution was reserved for a much later age.

For many centuries apprenticeship remained the typical, perhaps the only form of craft instruction. Professor Seybolt terms it "the most fundamental educational institution of the [colonial] period." It is of interest to note the fact that an apprenticeship without legal forms had been tried in America by the Moravians. Little has been written about their vocational instruction, and, since its development parallels the history of craft instruction in general, it may be summarized by way of review. Until 1769 the Moravians gave their boys to master workmen for instruction. The master had little or no control over the boys, for he only stood an *Elternstatt*. This relationship, which neither the boys nor the master fully understood, proved to be unsatisfactory and was replaced after that year by legal indenture.² Just so the vague forms of personal apprenticeship had given place to binding legal contracts in the guilds.

Thus far we have considered craft education in a form which did not conceive itself as educational in the modern sense. Apprenticeship in all its forms aimed at the attainment of an immediate, practical objective—the mastery of a trade. From it we have inherited the ideal of technical training and sound craftsmanship. Like modern vocational education, the trade school and the mechanics' institute made pretensions to serving a larger purpose.

Notwithstanding the name, the manual labor school movement is not to be looked upon as continuing the direct line of development in manual education. So little mention is made of the manual labor school in recent histories that it is necessary to explain the situation. Beginning with the foundation in 1797 of the Lethe Manual Labor School, there spread over the United States during the next 50 years a veritable wave of enthusiasm for the new idea. The self-supporting school of Fellenberg, at Hofwyl, Switzerland, became the

² Cf. Bethabara Diary, Jan. 2, 1769. (Preserved in the archives of the Moravian Church, Southern Province, Winston-Salem, N. C.)

model of many a struggling academy or seminary. A more successful attempt than the South Carolina venture, which has dropped entirely out of view, was the Maine Wesleyan Seminary, founded in 1820 by Elihu Robinson, of Augusta, Me., and put in operation in the spring of 1825. The next in order of time was the Oneida Institute of Science and History, founded at Whitesboro, N. Y., in 1826. Both the Wesleyan and the Oneida enterprises were successful and became the models after which were patterned the vast number of manual labor institutions that sprang up during the period between 1830 and the time of enactment of the United States land grant act, in July, 1862. Moreover, their success fanned the flame of popular demand for a more practical education, and led to the formation of societies the avowed aim of which was the establishment of similar schools. Noteworthy among these organizations was, for instance, the Society for the Promotion of Manual Labor in Literary Institutions, which was founded in the city of New York in 1831. An active propaganda carried on by this society made possible the establishment of some of our foremost theological seminaries and academies.

With hardly an exception the types of physical training offered by the manual labor schools grew out of the immediate industrial demands of the locality. We find the operation of water-power machinery prominent in the schools of the New England States; agriculture universal in the Southern States; and cooper, cabinet, wagon, and packing-case work in vogue in the Middle Western States. Although the schools were wholly dependent on the sales of their goods to the community, yet the idea of making and of keeping the enterprise self-contained was never lost sight of. To a certain extent, indeed, these schools were also self-constructed. On one occasion we are told that "the president and the students performed the whole labor of erecting a building 31 feet square and two stories high." The supervision of work in the fields and at the bench, to which from three to five hours a day were devoted, fell to the lot of the academic teachers. In some instances it was prescribed in the charter that work should be begun by 4 o'clock in the morning during the summer months. The manual labor school was a self-supporting institution in a day when cash was hard to raise. It was not an institution concerned with craft instruction, except in so far as manual labor was necessary to the prosperity of the school. Education in the manual arts was a necessary evil, not an end in itself.³

³Cf. Edward B., "Education and literary institutions," *Am. Quar. Reg.*, 5: 273-333, May, 1833; *ibid.*, 2: 107-118, November, 1829; Barnard, H., "Society for promoting manual labor," *Am. Jour. Ed.*, 15: 232-235, 1865.

The manual labor movement seems not to have run its course, or perhaps has gained a new lease of life; witness the much discussed reorganization of Antioch College.

With the manual labor school disposed of, we may return to the direction of descent in manual education. Two types of institutions, which can be most readily characterized by contrast, continued the task. The chief end of these organizations, the mechanics' institute and the trade school, was practical—just as had been that of apprenticeship. More appears to be known about the historical development of the mechanics' institute than about that of the trade school. In answer to the demand for extracurricular instruction in the handicrafts, institutions were created which possessed libraries and offered instruction in the evening. The high cost and scarcity of books and the stimulation of interest in invention, due to the industrial revolution, seem to have been important factors in the development of these organizations. Attendance on the classes was voluntary and often restricted to those employed in the trades. Opportunities for technical training and study were offered both to master workmen and to apprentices. The instruction was practical and designed to bring immediate benefit to the student. Many other interesting features of the mechanics' institute, which are still exemplified by the famous Franklin Institute of Philadelphia, can only be mentioned summarily, as they do not involve class instruction in the arts: The discussion and examination of new inventions, the support of lectures on technical subjects and of fairs or exhibits of mechanical devices, the display of interest in questions touching the economic interests of the State. The schools maintained by the mechanics' institute differed in almost every important regard from the trade schools. In the trade school, class instruction was given during the day, dividing the time between study and tool work. The interests of the trade school were sectional, rather than national, and looked toward the promotion of certain favored industries.

Beyond the point reached by the mechanics' institute and the trade school it was impossible for craft education to advance. Improvements in details came in due course, but the subject matter was never examined systematically. This reexamination and revaluation of the educational material of the handicrafts was performed by the manual training school movement. Progress in manual education was on a dead center; and, although the foundations of the manual training school idea are vulnerable from the psychologist's point of view, it was fruitful for all later manual education. Manual training, as the term will be employed in the following pages, is the application of the methods of formal discipline to instruction in the manual arts. The formulation of manual training as an educational theory and as educational practice marks the start of serious thinking about the function of vocational education and guidance in the curriculum of the secondary school.

To manual training the secondary school owes the very existence of vocational education in the curriculum, for hand work could at that time have been introduced into the schools only under the cloak of formal discipline. To manual training the secondary school further owes to a very large extent the subject matter and the technique of vocational education. The "demonstration" of the tool process before the class is still, although in a slightly different form, the boast of the good teacher. Without laboring our point excessively we may note that although the so-called "Russian system," or "Russian sloyd," is now discredited, it must be acknowledged that its intent, the analysis of fundamental tool processes, has found fuller expression and development in Taylor's Scientific Management.

The following history of the Manual Training School of Washington University is concerned with the last episode in the development of craft education. To this institution American education is chiefly indebted for the introduction of handicrafts into the secondary schools and for the awakening of an intelligent interest in their extension. Moreover, it was not an accident that the step forward was taken by one of the newer educational foundations, for Washington University attempted from its very beginning the solution of the problem of practical education, and has been justly proud of its leadership. It is interesting to turn back 45 years and to read what President William G. Eliot had to say in his report to the corporation for the year 1879:

It will hereafter be a source of pride that our university has been the first in the world to set aside the traditions of medieval ages, by making hand instruction a recognized part of liberal education.³

Comprehensive provisions for the establishment of an institute designed to provide the means of a thorough and complete education with particular view to practical usefulness were a part of the original scheme of those obtaining a charter for the university.⁴ The interest of the founders in this portion of their plan is evinced by the early practical department—"a department," in the words of Chancellor Chauvenet, "for the benefit of industrious mechanics and for no others."⁵ Its establishment preceded that of the academic and scientific departments.⁶ To find the primordial idea which was to culminate in the St. Louis Manual Training School we must,

³ Informal Report of President Wm. G. Eliot on the Interests and Conditions of Washington University, March, 1880, p. 7.

⁴ Constitution and By-laws of the O'Fallon Polytechnic Institute, St. Louis, 1855, p. 5. "The plan of that university organization is more extensive in its range than any before adopted in the United States." Cf. O'Fallon Polytechnic Institute; Its Object and Present Condition, 1858, p. 3.

⁵ Letters of Chancellor Chauvenet, Feb. 8, 1867, Cf. Thirteenth An. Rep. of Directors of the St. Louis Public Schools, St. Louis, 1867, p. 52.

⁶ Catalogue, Washington Univ., St. Louis, 1856-57, p. 22.

therefore, go back 64 years—to the foundation of the O'Fallon Polytechnic Institute by the Washington University trustees. From that day to this there has never been a time when the university's rolls have not numbered students engaged in such work.

In order that the reader may more readily see the relationship of the various foundations which preceded the actual establishment of the St. Louis Manual Training School, they are given in chronological sequence: The O'Fallon Polytechnic Institute, the polytechnic shop of Washington University, the Philibert Mansion shops of Washington University. These three will be discussed briefly, the fact being noted that the first, although practically a failure as an educational agency, makes evident the early and long-abiding interest in manual education on the part of Washington University. In the shops of the polytechnic department some were striving to realize a vaguely perceived educational idea. When, in 1879, the interest of the trustees and the capabilities developed in the polytechnic shops were welded together by the enthusiasm of Prof. Calvin M. Woodward, the manual training school was created.

In the first place, then, should be considered the O'Fallon Polytechnic Institute, a foundation attended with many misfortunes. This evinced an interest in manual training, although the institute contributed little directly to actual education.

The Hon. John How, president of the institute, deemed it the proudest act of his life to have been instrumental in the establishment of such an institution.⁷ In a brief speech during the inauguration ceremonies of the university (1857) he explained the educational innovation to the assemblage:

Our desire is to establish here in St. Louis an institution that shall have all the advantages of the mechanics' institutes of our country, with those of Berlin, Vienna, and other cities of Europe.⁸

Upon the same auspicious occasion Judge Samuel Treat voiced the sentiments of the institute board in declaring: "There are more unwritten volumes of valuable information in the mart and workshops than have been gathered into our libraries."⁹ The O'Fallon Polytechnic Institute was intended, like the later manual training school, to "prove useful and advantageous to the manufacturers of St. Louis."¹⁰ From the very foundation it furnished, through its evening schools, to the apprentices and journeymen of the city such facilities for education as they most needed.¹¹ During the years 1856-

⁷ 13th An. Rep. of Directors of the St. Louis Pub. Schs., St. Louis, 1866-67, p. 52.

⁸ Inauguration of Washington University at St. Louis, Mo., Apr. 23, 1857, Boston (Little, Brown, and Co.), St. Louis (Halsall and Co.), p. 22.

⁹ Ibid., p. 33.

¹⁰ Constitution and By-laws of the O'Fallon Polytechnic Institute, St. Louis, 1855, p. 9.

¹¹ The O'Fallon Polytechnic Institute, Its Objects and Present Conditions, St. Louis, 1858, p. 10.

1858, in addition to the "common branches," advanced classes were instructed in mechanical and industrial drawing, algebra, and mensuration.¹² In an early lecture on manual education (1878) Calvin M. Woodward, principal of the institute in 1868-69, and later an important figure in the St. Louis Manual Training School, recalled that "as a part of the founders' generous plan the many arts were not only to be scientifically expounded by able professors but they were to be illustrated by practical machines and expert workmen."¹³

What was actually accomplished in the way of technical education at the O'Fallon Polytechnic Institute can not now be discovered. The records of the school are not available, indeed are probably not in existence. Its significance in the history of the St. Louis Manual Training School lies in the fact that it is the first hint of the use of manual education in the city. Almost from the beginning, then, Washington University (founded 1853) had displayed an interest in the practical side of instruction in the mechanic arts—an abiding interest which was to come to fruition in the manual-training school. The O'Fallon Polytechnic Institute is but the first demonstration thereof. From the prefatory remarks it is clear that the institute was nothing more or less than a mechanics' institute adapted to the needs of antebellum St. Louis. Outside of working hours it offered the opportunity for willing boys to advance themselves in their respective trades. It had no greater pretensions.

Though it was undertaken with the highest motives, the O'Fallon Polytechnic Institute as projected was virtually a failure. Financial stress following the inauguration of the university was intensified by a number of disorganizing factors incident to the Civil War period. The building at Seventh and Chestnut Streets had been begun before the war. At different times the work had been stopped, only to be renewed later at a tremendous increase in cost.¹⁴ After nine long years the building was completed (June 12, 1867) and dedicated with proper ceremonies. But its completion had seriously embarrassed its managers and endangered the consummation of the charitable designs of its founders. We learn, however, from the history of the St. Louis public evening schools, which had shared in the management of the O'Fallon Polytechnic Institute, that the university never wholly abandoned its theory of practical instruction. When the half million dollar polytechnic building was sold to the municipal authorities (October 1, 1868) at practically one-fourth its original cost the terms of the transfer obligated the school board "to establish permanently, for the special benefit of those

¹² Ibid., p. 11.

¹³ Woodward, C. M., *Manual Education*, a paper read before the St. Louis Soc. Sci. Assoc., May 16, 1878, St. Louis (G. I. Jones Co., printer), p. 28.

¹⁴ Compton, Richard. *Pictorial St. Louis*, St. Louis, 1876, p. 169.

engaged in or preparing for mechanical pursuits, a school in which are taught elementary and preparatory branches of polytechnic or technological instruction."¹⁵ The pupils of the O'Fallon Polytechnic Institute were, notwithstanding this arrangement, counted as a part of the Washington University. The general plan of the institution, as well as its name, continued as it had been while under the sole care and supervision of Washington University.¹⁶ But with its further history and final fate we are not now concerned.

Other available records of Washington University reveal further evidence of the continuity of this theory of practical education. A supplementary catalogue published by the university in 1871 announced that:

There will be fitted up a workshop containing an elegant lathe made expressly for the university by the Fitchburg Machine Co., of Massachusetts, for turning wood and iron; a workbench and a full set of carpenter's tools. The engineering students will be able here to acquire some dexterity in the use of tools which, though slight, will be of great value to them in the subsequent work of their profession (i. e., this experience will make them better judges of workmanship).¹⁷

This shop was equipped and operated in the polytechnic department under the personal supervision of Calvin M. Woodward and seems to have been the beginning of his lifelong interest in manual training. The subject was reshaped and given new form by his reading of certain projects discussed in connection with some eastern schools. Indeed, the adapting of manual arts to instruction, in schools of lower than college grade was carried out later under the influence of new knowledge that came to Woodward in the next decade.

There was, according to Mr. Edward C. Eliot, a very interesting predecessor of the shop announced in the catalogue of 1871. Mr. Eliot's letter gives the facts concisely:

For the origin of the manual-training school, Dr. C. M. Woodward is, of course, entitled to full academic credit. But physically speaking, the manual-training school began in the shop of Noah Dean, the university carpenter.

In the latter part of the Civil War Dean was ship's carpenter on the flagship of Admiral Porter in the Mississippi flotilla. After the war he was out of a job, and a shop was fitted up for him, first at the residence of Doctor Eliot, president of Washington University, and afterwards in the university buildings. He was a master of his trade. There was no useful mechanical purpose of his time to which he could not turn his hand.

About 1871 the first benches and lathes for training students were placed in Dean's shop. I was one of the students, on what basis I do not remember; but

¹⁵ Fourteenth An. Rep. Bd. of Directors St. Louis Pub. Schs., 1868, pp. 7-8.

¹⁶ Catalogue, Wash. Univ., St. Louis, 1868-69, p. 75.

¹⁷ A Supplementary Catalogue of Washington University, with a general description of the apparatus used and the methods of instruction followed, St. Louis (F. Hobart Co., printers), 1871, p. 39.

by 1878 the work had been transferred to the old Phillibert residence, which backed into the university premises; and I became an instructor in wood turning under Clinton D. Kellog, who was placed in charge.

This was, I think, the beginning of the manual-training school.

In other words, the carpenter shop of Noah Dean attracted mechanically minded boys, and in the course of a few years provision was made for their amusement and incidental instruction. We seem to be living in St. Louis of ante bellum days; for it is said that the shop of Noah Dean, a long, low building with no more than one door, was originally the slave quarters. The house had been owned by Dr. William Beaumont, who is still famous for his study of the digestive processes, based on his observation of the stomach of Alexis St. Martin.¹⁸ From Doctor Beaumont the house passed into the hands of President Eliot. Noah Dean, too, is an interesting figure, but that is another story. It is an easy matter to form an impression of the new shop in the university building to which Noah Dean moved from the slave quarters; for Mrs. Charles F. White, daughter of Noah Dean, has found in her father's papers a photograph taken in 1870 or 1871.

The first public announcement of the new departure appears to have been the public lecture of Woodward on October 24, 1873, which is extracted in a pamphlet of 1877 and printed in full in his book, *The Manual Training School*.¹⁹ Judged by modern standards of educational theory, Woodward had no clearly thought-out program; nor does he at first base his case on any principles of educational psychology. A certain haziness of purpose, as might be expected, prevails in these early, formative documents. President Eliot calls the school "an experiment on a very small scale, with no clear outline of progress, but one which has gradually shaped itself into a systematic plan of action."²⁰ Yet two principles which Woodward enunciated at this time have a strangely modern sound, although it is difficult to say to what extent these wholly admirable doctrines were realized in the first school:

First, the things studied and taught are of immediate importance and intrinsic value. Second, one is not supposed to understand a process or an experiment until he has performed it.²¹

*The most significant point made by Woodward in his speech of 1873, and the one which justly entitled him to the name of the "father of manual training," is the assertion that training in the manual arts was desirable and advantageous for all pupils, regardless of their educational aims. By the time that he wrote his book

¹⁸ See Meyer, J. S., *Life and Letters of Dr. William Beaumont*, St. Louis, 1912.

¹⁹ Woodward, C. M., *The Manual Training School*, Boston, 1877, pp. 240-260.

²⁰ An. Rep. President to Bd. of Directors of Wash. Univ., St. Louis, May, 1883, p. 5.

²¹ Woodward, C. M., *The Manual Training School*, Boston, 1887, p. 254.

of 1887 the novelty of his suggestion had become more apparent to him, for he declared as the second point made in his speech of 1873 that "it presents very clearly the necessity for manual training on the part of all children, outside as well as inside the polytechnic school."²² It seems that Woodward was at first not wholly aware of the newness of the suggestion that he was making. It is introduced in a modest fashion, as follows: "I therefore plead for a more extended and more systematic physical, i. e. manual, education. It is the *only* means for making that culture of practical use."²³ But he is unable to dissociate himself from the world of the professional engineering student, for he continues with an illustration in which such a student displays advantageously a knowledge of the fundamental principles of mechanics.²⁴ In regard to drawing, "the shorthand language of modern science," he remarked: "As an educator of the eye, drawing is a most valuable means, *irrespective of any service that the power may be of itself.*"²⁵ The significance of this passage as throwing a sidelight on Woodward's conception of educational theory and problems will be taken up later. In this address he very vigorously defended the dignity of a technical education by pointing out that the dominant evil of the times was the insufficient diffusion of that type of knowledge which fitted one for the art of being useful:

To speak allegorically, we start out together. It is absolutely necessary to the world's progress that we travel by different roads. The labor of each but complements the labors of the rest; therefore we will not call my education liberal and yours illiberal.²⁶

In a somewhat different form Woodward renewed the suggestion of a school for hand training in an essay on Manual Education in the Polytechnic School, published in October, 1877. Upon this occasion he outlined the features of a school that should give a general mechanical course. "As students below the age of 18," it was confidently assured, "may profitably enter such a shop, the attention of managers of grammar and preparatory schools is earnestly directed to the subject." In vindication of the establishment of a special mechanical course for students who have special aptitudes in certain directions but who find great difficulty in mastering certain subjects in other directions, he closed by saying: "Moreover, a year in such a class would be of great service in *developing natural aptitudes.*"²⁷

Clearly, then, Woodward was only slowly approaching the idea of the value of manual training in general secondary education.

²² Ibid., p. 240, note.

²³ Ibid., p. 256.

²⁴ Ibid., p. 257. The italics are author's.

²⁵ Woodward, C. M., *The Manual Training School*, Boston, 1887, p. 252.

²⁷ Woodward, C. M., *Manual Education in the Polytechnic School of Washington University*, St. Louis, Oct. 1, 1877, pp. 1-20. The italics are author's.

He has not thus far taken a positive and unmistakable stand on the position that manual training is a desirable addition to the curriculum of the secondary school, although before long we shall see him declaring this as the chief plank in his educational platform.

With the passage of time it has become well-nigh impossible to form an idea of what was actually done in the manual shop of the polytechnic department, the immediate predecessor of the St. Louis Manual Training School. For information on this score, we are limited to the pamphlet of 1877, to the contemporary catalogues of the university, and to the press notices of exhibitions. From these we learn that the shop was small and inadequate, and that the equipment was insufficient. It consisted of a single workbench, two foot lathes, a gear cutter, and a small portable forge, together with a miscellaneous assortment of bench tools. It was, in fact, but the typical shop of the village "méchanical engineer" of old England. From the start the defects of the shop were apparent; there were neither tools nor room for all the members of a single class. The light admitted by the basement windows was so dim that on cloudy afternoons work was entirely suspended. For five years engineering students engaged in some hand and machine tool work in this basement shop—turning brass wheels, cutting gear teeth, graduating circles, making wooden and iron girders and apparatus for illustration of mechanical principles.

In 1877, at the annual exhibit of the St. Louis Fair Association, the students displayed a model of the recently completed St. Louis Bridge.²⁸ According to the prevailing method of instruction, each student made a sketch of his own project and then, under the direction of the professors and with the assistance of the university carpenter, Noah Dean, executed it.²⁹ A systematic manual arts curriculum, of course, did not exist in the "manual shop." There was for some time no series of graded exercises for the pupils. Toward the end of the period—that is to say, by 1876 and 1877—Woodward became aware of what he epitomized as the "true method of tool instruction." This method was soon to take shape in the Philibert Mansion shops of the university and still later in the manual training school.

The men with whom Woodward was associated in the management of the "manual shop" later became distinguished in many fields. Mr. Edward C. Eliot, one of the teachers of that day, has generously lent me a photograph of the faculty and students of the polytechnic

²⁸ It may be remarked in passing that a history of the conception and construction of this epoch-making engineering feat won for Woodward the degree of Ph. D. (Washington University).

²⁹ Woodward, C. M., *Manual Education in the Polytechnic School of Washington University*, St. Louis, Oct. 1, 1877, pp 11-12.

department taken for the Centennial Exposition of 1876. This photograph, which is reproduced, is interesting to us for the faces of Woodward, Edward C. Eliot, Noah Dean, and C. D. Kellogg, who were immediately concerned with the manual shop.

During the summer of 1877 a group or "series" of shops and storerooms was installed in a transformed dwelling house fronting on St. Charles Street. This building was known to early St. Louisans as the Philibert Mansion. In 1888 President Eliot, in recommending that this structure be pulled down and that a modern gymnasium be erected in its stead, characterized it as "a dilapidated old tenement, an encumbrance to the university grounds."³⁰

It is upon the scanty press notices of two exhibitions of shop-work and drawing that we must rely for information concerning an important transition period dating from 1877 to 1880. The first of these exhibitions was held on June 10, 1879, in the rooms of the newly established St. Louis Art school:

Out in the room at the west end, near the life-sketching room, were all the samples of turning, fitting, and forging turned out by the students of the St. Louis Manual Training School and the drawings submitted in connection with these for mechanical degrees.³¹

As we shall see, the ordinance establishing the manual-training school as a separate and distinct department of Washington University was not adopted until June 6, 1879, only five days before the exhibition was held. No mention was made by the reporter of plans for the new school. Apparently the Philibert Mansion shops were popularly known as the St. Louis Manual Training School over a year before the new and so-called "pioneer school" was opened.

From another press account of an exhibition held at the new manual training school building during the summer of 1880 we learn that the wasteful method of individual instruction employed in the earlier polytechnic classes has given way to the Russian system:

All the work was laid out in graduated order: first the wood fitting to dimensions, the dovetailing, etc., of the freshmen class; then the wood turning of the sophomores and the work at the forge and in the machine shop of the juniors. An ordinary individual unversed in mechanical arts would see simply so many pieces of wood and iron of various shapes, but the mechanic would readily see that to achieve the work here presented the student had to acquire a thorough knowledge of the use of his machine. Some of the turning work involves almost every operation to be performed on a lathe, while the turning in iron was seemingly perfect, and some of the screws and gear cutting beyond all praise.³²

³⁰ Eliot, William G., President, Informal Report on the Interests and Condition of Washington University, March, 1880, p. 8.

³¹ Account of exhibition at manual-training school; St. Louis Globe Democrat, June 16, 1880.

³² Graduating day, the drawing at Washington University, St. Louis Globe Democrat, June 12, 1879.

Woodward had found what he so long sought—a scheme of economical classroom procedure which employed carefully graded exercises lending themselves to demonstrative methods in the hands of a teacher.

The shops we have been speaking of were financed from private means. Gottlieb Conzelman was the first to contribute (1877) toward their maintenance. Later Woodward heard, through James Yeatman, president of the sanitary commission, that Edwin Harrison was anxious to help the school. "Harrison, on being told that it would take \$1,300 to carry the work for a year, cheerfully gave the money, and the school ran on."³⁴ These names are significant; Messrs. Conzelman and Harrison became the trustees of the new manual training school when it was founded, and remained loyal friends of the cause of manual education throughout their lives.

In the shops of the polytechnic department of Washington University a class of some 30 boys from Smith Academy, a preparatory school of the university, were given systematic instruction in the care and use of tools, *in addition to the usual high-school curriculum*. We may fairly say that for the first time in the history of America manual training becomes a part of general secondary education.³⁵

The definite impulse which resulted in the establishment of the St. Louis Manual Training School proper may be traced to a paper read by Woodward before the St. Louis Social Science Association, May 16, 1878. On this occasion he based his arguments on economic grounds, the point of departure being the backward condition of trade education in America as compared with Europe. He complained that, owing to the various influences about our pupils, nearly all our skilled workmen are foreign trained. For this state of affairs he assigned as causes the limited opportunities to learn a trade, the dominance and tyranny of trade-unions, and the deplorable condition into which the institution of apprenticeship had degenerated. "It is no wonder," he remarked, "that boys of fair education shrink from manual labor." Another reason he assigns for their shunning it is the desire to be rich. "Wealth is regarded as a prize in a lottery, and the laboring men always draw blanks." He reviewed the successes of certain trade and craft schools which he declared were admirably adapted to continental conditions. Such schools, however, could not be transferred bodily to American soil. What was wanted were schools patterned after the Massachusetts Institute of Technology and after the embryo manual training shop in actual operation at Washington University. By such agencies he hoped

³⁴ Washington University, opening and inspection of the manual training school, St. Louis Globe Democrat, June 10, 1880.

³⁵ Catalogue, Washington University, 1877-78, p. 88.

to find a partial remedy for the deplorable conditions existing in industry. In closing he said:

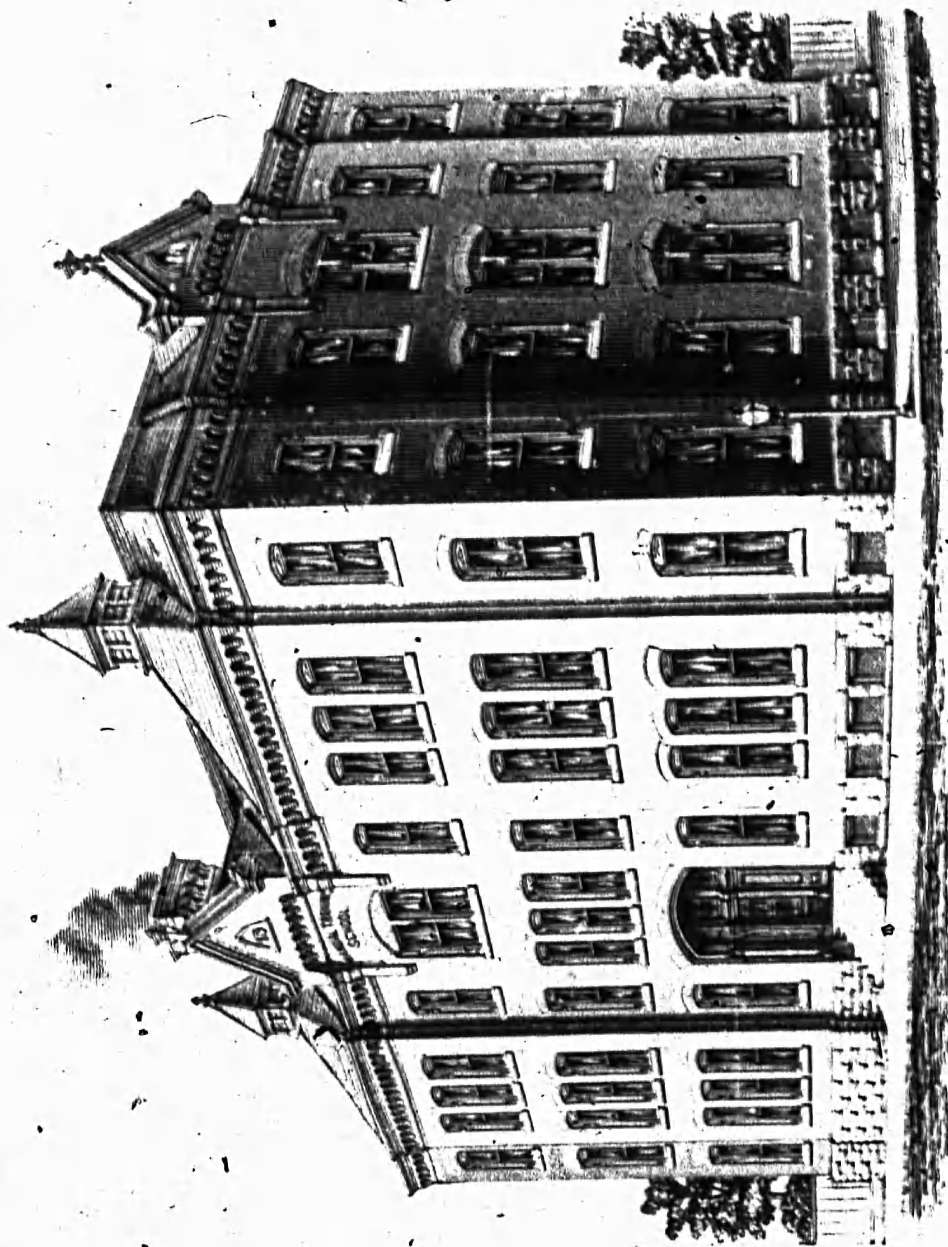
The manual education, which begins in the kindergarten before the children are able to read a word, should never cease, but just how we shall supply the missing link in the chain which shall join the kindergarten with the fully equipped shops of the polytechnic school we can not with certainty suggest.

While Woodward never completely forged the "link" he mentioned in his address of 1878, nevertheless he was unceasingly active in interesting the people of St. Louis in the possibilities of manual training, public and private, from the kindergarten through the polytechnic school. He put his whole soul into the cause; and what he did contributed very materially toward creating a popular sentiment that later on became strong enough to make the establishment of public manual training schools a possibility. We have found him interested in the O'Fallon Polytechnic Institute, a moving force in the manual shops associated with the polytechnic department of Washington University, and soon to be the founder of the manual training school itself.

For some time we have been following one thread, the agitation in favor of the introduction of manual training and the history of the local predecessors of the St. Louis Manual Training School. It is now necessary to take up another thread, the history of the school as a distinct institution. The founding of the new enterprise will perhaps be most clearly understood if we consider it as a process consisting of two important steps, viz, the first meetings of the men who later became the board of managers, and secondly, the prospectus announcing to the public the plan proposed. Supplementary to these matters, it is worth while to put on record what seem to be the significant facts concerning the pioneer manual training school, the founders, and the physical property of the school in the early years.

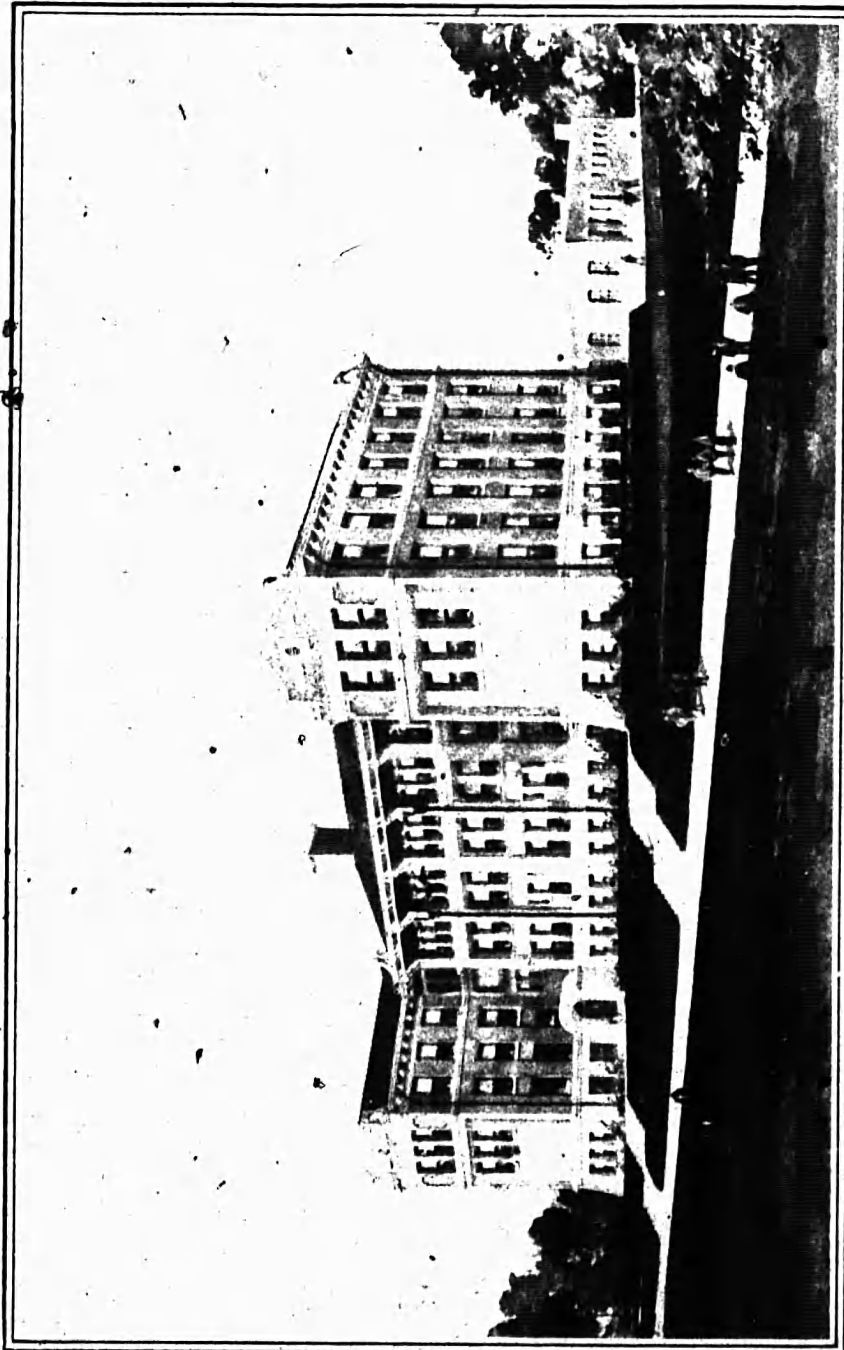
The first meeting in the interest of the manual-training school of Washington University was held at the office of Edwin Harrison, of the St. Louis Smelting & Refining Co., in May, 1879. There were present William G. Eliot, chancellor of Washington University, Gottlieb Conzelman, Edwin Harrison, Samuel Cupples, and Calvin M. Woodward. This group of prominent business men had been brought together, it seems, by the efforts of Calvin M. Woodward. We have already met their names in connection with prior endeavors to found a school for the manual arts. All owed their interest to the speeches of Woodward. Furthermore, Mr. Conzelman, we know, had learned a trade—that of upholstering. Samuel Cupples was then actively engaged in the manufacture of woodenware, and presumably had some antecedents of craftsmanship. Edwin Harrison

* Woodward, C. M., *The Manual Training School*, Boston, 1887, pp. 261-288.



BUREAU OF EDUCATION.

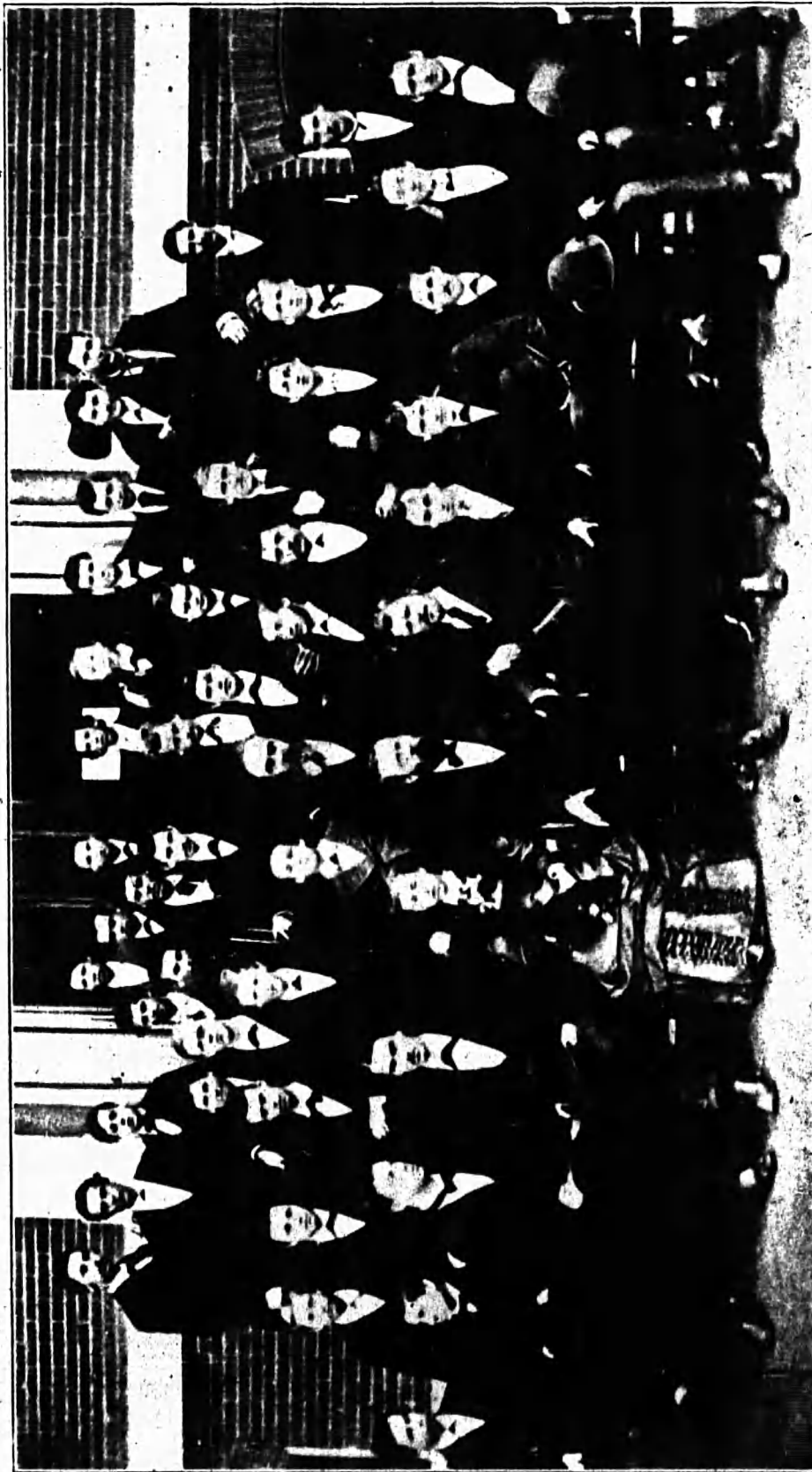
BULLETIN 1921, NO. 3. PLATE 2



THE MANUAL TRAINING SCHOOL OF WASHINGTON UNIVERSITY, 1905-1916.



CALVIN MILTON WOODWARD IN 1880

[illegible]

was managing a lead smeltery, while his previous education seems to have had less to do with the use of the hands. These three, then, had both theoretical and practical reasons for their interest. The general plan of a school for tool instruction was discussed, and, to judge from the minutes of the meeting, offers of financial assistance were made without delay. On that occasion Samuel Cupples offered to assist in making a thorough experiment of a manual-training school for boys and agreed to give \$3,000 a year for five years; Edwin Harrison to erect a suitable building, to cost about \$10,000; Chancellor Eliot to give a suitable lot of ground on the southwest corner of Washington Avenue and Eighteenth Street, valued at between \$6,000 and \$7,000; and Gottlieb Conzelman to give \$5,000 toward the fund necessary to furnish the building properly.³⁷

The second meeting in the interest of the manual-training school was held in the chancellor's room at the university (June 5, 1879) to discuss the provisions of the bill to be submitted to the board of directors of Washington University for establishing the manual-training school. The next day, June 6, 1879, the bill was adopted by the board substantially as recommended.³⁸ This action constituted the manual-training school as a distinct and separate preparatory department of the university. Under the same charter had been organized already two schools of like grade—Smith Academy, a classical school preparing boys for the university, and Mary Institute, a school for girls pursuing academic studies. The essential features of the document creating the manual-training school, printed in extenso in the appendix, were as follows:

A special school, to be known as the St. Louis Manual Training School of Washington University and having for its objects instruction in mathematics, drawing, and the English branches of a high-school course, together with instruction and practice in the care and use of tools, was provided for. The students were to divide their time as nearly as possible "between mental and manual labor."³⁹ Possibly the phrase "English branches of a high-school course" contains a latent ambiguity; for, although no mention is made of instruction in science or history in the ordinance, they are included in the course of study published later.

At the third meeting of the managing board, held in October, 1879, a draft of a prospectus of the school as written by Woodward was read and discussed. It was then ordered printed.⁴⁰ As this little pamphlet of some 24 pages was justly regarded as an educational curiosity at the time of its publication, it warrants some

³⁷ Minutes, Managing Bd., St. Louis Man. Tr. Sch., May meeting, 1879, pp. 1-2.

³⁸ Ibid., June meeting, 1879, pp. 2-3.

³⁹ See Appendix.

⁴⁰ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Oct. meeting, 1879, p. 4.

attention. Noteworthy, for example, is the fact that the school board of Birmingham, England, transcribed a large part of it.⁴ There are, probably, very few copies of this document in existence; one was given to the St. Louis Public Library by Mr. H. W. Howes, a descendant of the family resident in the Philibert Mansion, and perhaps three or four are in the files of Washington University. It is not mentioned in the later publications and has been overlooked thus far. Yet, notwithstanding its obscurity, one may term it the earliest practical formulation of the idea of manual training in the secondary school and the basis for calling the Manual Training School of Washington University the "pioneer manual-training school."

Under the caption "Origin and purpose of the school," it was announced:

The manual-training school owes its existence to the conviction on the part of the founders that the interests of St. Louis demand for young men a system of education which shall fit them for the actual duties of life in a more direct and positive manner than is done in the ordinary American school. * * * St. Louis already has large manufacturing as well as commercial interests, and we all expect to see these interests greatly increase. We see in the future an increasing demand for thoroughly trained men to take positions in manufacturing establishments as superintendents, as foremen, and as skilled workmen.

In the prospectus it was confidently asserted that—

Manual training will assist the student in finding his proper sphere of work and study, will foster a higher appreciation of the value and dignity of labor, and will afford a sounder judgment on all social problems. If, furthermore, the manual-training school should do nothing else, it would still justify all efforts on its behalf if it helps in the solution of the difficulties between labor and capital.⁵

The feature of special historical and educational interest to be noted in this prospectus is that manual training was not conceived of primarily as a cultural subject. Nothing is clearer than the fact that the St. Louis Manual Training School as projected by its founders never existed except on paper. It would have been difficult, indeed, to have inspired the merchants and manufacturers who pledged their financial support in the undertaking with a belief in an education which did not reveal itself in economic efficiency. Their avowed object was to found a school for the training of young men to take positions in manufacturing establishments as superintendents, as foremen, and as skilled workmen. While its director emphasized that the school was not to prepare the students for a certain trade, yet he was just as emphatic in asserting that the

⁴ Letter of Head Master E. M. Dixon, Allan Glen's Institution, Glasgow, to C. M. Woodward, Nov. 30, 1883. Filed in minutes of managing bd., Dec. 15, 1883.

⁵ Prospectus, The Manual Training School of Washington University, St. Louis, Nov., 1879 (Globe Democrat Printing Co.), pp. 7-11.

school would, by means of the Russian system of tool instruction, teach the essential mechanical principles of all the trades.⁴³ Another obvious inference to be drawn from this early document is that in the founders' minds the manual-training school was not looked upon preeminently as preparatory to the university. It is significant that, while many phrases which appeared in this prospectus were reiterated time and time again throughout the history of the school's publications, certain others which are quoted were either reworded or else disappear altogether.

The students will divide their working hours, as nearly as possible, between mental and *manual labor*.⁴⁴

There is doubtless much to be learned in the organization and administration of a manual training school on American soil, but its value to a manufacturing community has been demonstrated beyond question * * *. Thousands and thousands of the skilled workmen, engineers, foremen, and manufacturers now in France and Germany got their education and their intellectual training simultaneously in a *manual training school*.⁴⁵

We now come to the manual training proper—to that feature which is to distinguish this school from those around it. How shall we train the hand to keep pace with the eye and the mind, and to fit it well for its future uses? During the last 100 years the world has made rapid strides in the invention and use of tools. We do nothing with the unaided hand; everything is done by tools. Tool instruction then is what is wanted. Instruction in the nature, theory, and use of tools. Thus shall we place within reach the *key with which to unlock the mysteries of our busy shops and factories*.⁴⁶

A single idea was conveyed by these remarks, which have been selected from a variety of contexts in the prospectus. The idea, as has been said, was not to reappear in the later official publications; the author was obviously writing a prospectus for a school patterned after what were inadvertently termed "manual training schools," but which in reality were the European trade and apprenticeship schools—feeders for the industries.

In the remarks of two of the founders, and in the will of a notable early benefactor, there is cumulative evidence that in their minds the dissemination of industrial intelligence was the fundamental and the primary purpose of the school, Chancellor Eliot stated, in an address delivered February 22, 1882, that:

The school has 100 student workmen busily engaged in acquiring the elements of a sound mental education at the same time with practical training in the use of tools, to fit them for the intelligent application of skilled labor in whatever direction the growing industries of manufactories and workshops may require.⁴⁷

⁴³ Catalogue, St. Louis Man. Tr. Sch., 1884-85, p. 38.

⁴⁴ Prospectus, The Manual Training School of Washington University, Nov., 1879, p. 5. In the school's catalogue for 1883-84, p. 6, the word "labor" has been changed to "exercises."

⁴⁵ Ibid., p. 20.

⁴⁶ Ibid., pp. 12-13. Italics are author's.

⁴⁷ Eliot, Wm. G., 25th Centennial Address, Washington University, Feb. 22, 1882, p. 21.

In the same year Edwin Harrison depicted the school as giving "such an education as will effectually enable the mechanic's brain intelligently to second the effort of his trained and skillful hand."⁴⁸ The will of Ralph Sellew made the St. Louis *Manual Labor* Training School of Washington University a legatee.⁴⁹ His alteration of the name of the school shows distinctly what was in his mind.

On the other hand, the phrases dealing with the social and disciplinary value of manual training, with the policy of the shop, and with general information concerning the curriculum, are retained and enlarged upon as the exigencies of its history demanded.

Under a special caption it was specifically stated in the prospectus of 1879 that "pupils completing the course will be presented with diplomas. These diplomas will entitle the holders to enter the *sophomore class* of the polytechnic school without further examination."⁵⁰

As formulated in the ordinance of 1879 and sketched in the prospectus of the same year, the course of instruction covered three years. School time was to be equally divided between mental and manual labor. The courses as tentatively outlined proceeded simultaneously on five parallel lines—mathematics, literature, science, drawing, tools, and processes.⁵¹ The extent to which this program was carried out will be shown in the course of this history.

With a single exception the leading features of the first manual training school prospectus ever printed have been given. The omitted feature is that of the project requirement of candidates for graduation. In order thoroughly to appreciate it, the reader must have in mind the avowed purpose of the founders of the school: To establish a "trades-elements school," an adjunct to the open-shop industries of St. Louis:

Project for graduation.—Before receiving a diploma of the school each student must execute a project satisfactory to the faculty of the polytechnic school. The project shall consist of the actual construction of a machine. The finished machine must be accompanied by a full set of the working drawings according to which the machine was made, and the patterns used for the castings. Both drawings and the patterns must be the work of the student. The project shall remain the property of the school.⁵²

But for the limiting phrase, "satisfactory to the faculty of the polytechnic school," we might construe this section as an early

⁴⁸ See Reunion, Washington University, Apr. 22, 1882, p. 60.

⁴⁹ "I give and bequeath to Washington University in St. Louis, Mo., the sum of \$40,000, for the use and benefit of the manual labor training school connected with said university, and to be used by the faculty or board of managers of said university in such manner as they may consider for the best interest and greatest utility of said manual training school."—Cf. Will of Ralph Sellew, May 27, 1882.

⁵⁰ Prospectus, The Manual Training School of Washington University, Nov. 1879, p. 23. Italics are author's.

⁵¹ Ibid., pp. 14-15.

⁵² Prospectus, The Manual Training School of Washington University, Nov. 1879, p. 14.

example of "a problematic act carried to completion in its natural setting." As written, however, it must be taken to be a vestigial remnant of the early craft guild ordinances regulating admission of apprentices to the craft.

Upon completion of the term of service the apprentice was permitted to follow his trade or calling as a master craftsman. The authorities of the guild insisted, however, that he have served a successful apprenticeship.⁵³

Hence he was required to submit as evidence of his proficiency a masterpiece, a "project" in modern educational terminology.⁵⁴

This concludes what needs to be said about the "Prospectus." The little pamphlet was to have consequences which its author had not foreseen. The work of organization was actively carried on and was crowned with success in the following year.

At a meeting held in May, 1880, the board's chairman, Edwin Harrison, announced that as Samuel Cupples proposed to leave St. Louis for Europe to be gone several months, it was thought best to meet and determine certain important matters connected with the institution without delay. It was voted that the school open in September, on the same day with the public schools of the city. Woodward was authorized to issue 1,000 circulars of information in regard to it. No copy of this circular has been found, but doubtless it pertained to the examinations to be held on June 7, 1880, tuition fees, etc.⁵⁵

Inasmuch as the outside reader knows little of St. Louis, it is proper to say something at this point concerning the history of the first building and the friends of the school.

The southwest corner of Eighteenth Street and Washington Avenue, on which the first building of the manual training school stood, is now in the heart of the wholesale and jobbing districts of St. Louis. At the time the building was erected the location was one of the best for schools in the city. It was high and had a commanding view east and west. Even as late as 1879 it savored of the rural districts. The boys had broad acres upon which they might roam and plenty of room at their disposal to accommodate football, baseball, and other games. Rigid building restrictions played a part in making Lucas Place, only a block from the manual training school, the most beautiful spot in the city. Every home on the former fashionable residence street of St. Louis could tell its story of people who contributed important chapters to the records of the Nation.

⁵³ Seybolt, R. F., *Apprenticeship and Apprenticeship Education in Colonial New England and New York* (New York), 1917, pp. 83-84. Class projects consisting of lathes, pumps, etc., supplanted individual "finals" in later years; cf. catalogues 1887-88, p. 28; 1897-98, p. 45.

⁵⁴ Lipson, E., *The Economic History of England* (London, 1915), p. 294.

⁵⁵ Minutes, Managing Bd. St. Louis Man. Tr. Sch., May 3, 1880, pp. 10-11.

On the corner of Fourteenth Street was the home of Senator Truett Polk, declared forfeited for treason at the time of the Civil War. Next west of the Polk residence was that of Thomas Allen, one of the projectors of the Pacific Railroad, "the road which Thomas Benton had in his prophetic mind when he pointed to the West and declared 'There is East: there is India.'" In the Lucas Place mansion of the romantic Robert Campbell—

a dinner and ball were given in honor of Gen. U. S. Grant, at that time President, and his wife; on which occasion they, accompanied by Gen. W. S. Harney, appeared on the front balcony and responded to the vast crowd of serenaders who gathered to do them honor.

Here, too, was the home of Giles Filley, closely associated with General Lyon and Frank Blair in the measures then taken to keep Missouri in its place in the Union.⁵⁶ Bordering these historical landmarks were the closely grouped and time-weathered buildings of Washington University, including the observatory—"a little building of brick, 16 feet in diameter, and that looked like a bake oven with a revolving top."⁵⁷ Smith Academy, manual's athletic rival, was but a few doors further west. Mary Institute, "exclusively for young ladies," stood at Beaumont and Locust, some six blocks beyond, in the rural wilds.

A representation in perspective of the building, printed in the early catalogues and reproduced here, shows it to have been a substantial three-story brick building about 100 by 50 feet. It contained four shops and one drawing room each 40 by 40 feet, two recitation rooms 20 by 20 feet, and two small offices—one for the principal and the other for the shop superintendent. It was completed during the winter of 1879 and 1880. Passers-by were invariably attracted by the great chimney attached to one corner of the building and by the revolving flywheel of the Corliss engine that could be seen through the street windows. The chimney was a part of an extensive heating plant for the entire group of university buildings. The training school, however, was heated by exhaust steam from the engine. A reporter who visited the building in October, 1881, has given some idea of the interior furnishings of the assembly room:

The large room in which all the divisions assemble is exceedingly light and attractive. It is furnished with 60 chairs and desks, the latter being of a novel and very convenient pattern, designed especially for the school. When the top is down it looks like an ordinary desk, but the top is hinged in front,

⁵⁶ Post, Henry M., "St. Louis fifty years ago," St. Louis Globe Democrat, Jan. 18, 1914, p. 11.

⁵⁷ It contained the university clock "whose tick was heard simultaneously in Texarkana and Denver City."

and the back may be raised and secured at any convenient height. Two wooden buttons on the lower edge support the drawing board or a book, as may be desired.⁶⁸

At the time of establishment by ordinance the school had neither house nor land, but general plans for an endowed institution had been formed and the necessary aid had been pledged by generous men. In the progress of the manual-training school subscription list an early prophetic utterance of Samuel Cupples was destined to be fulfilled. Speaking to a reporter, he said, "Strong men will join us when they see we are on the road to success."

⁶⁸ Unidentified press clipping. Filed in minutes Managing Bd., October meeting, 1880, p. 12.

Chapter II.

HISTORY OF THE SCHOOL, 1880-1915.

Than the entrance of the Manual Training School of Washington University into the field of secondary education, its growth, its influence, and its decline, there are not many more memorable instances in the history of American education. Its opening occurred on June 7, 1880. At this time a class of 14 boys were examined for admission. The examination was given in writing and was of the grade required for admission into the Central High School of St. Louis. In commenting upon the questions submitted, a reporter said:

If any boy came before the examiner of yesterday imbued with the idea that the school was a sort of refuge for boys who have no intellectual ability, it was suddenly dissipated at the sight of the first question.¹

Two days later—June 9, 1880—the partially equipped building was opened for public inspection. An exhibit of shop exercises executed by students of the polytechnic school and characteristic of what was to be offered as part of the new institution's program was a feature of the occasion.²

On September 6, 1880, with little previous knowledge of what could be done with boys as young as were those applying, instruction was begun with a class of about 50 pupils. During the entire year the number enrolled attained a total of 67. At the close of the year a modest exhibit of what had been done during the first year was held.³ Shopwork was limited to carpentry and wood turning, for, with the exception of the engine and a supply of tools for the students of the engineering department of the university, who continued to work in the manual shops until 1910, the shops were furnished only as they were needed by advancing classes.

We are fortunate in having a graphic contemporary account of the first display of students' work, and as shop exhibits have played a prominent part in the life of all manual-training schools, it will not be amiss to repeat it here. The most curious feature was the

¹ Washington University, "The Manual Training School," St. Louis Globe Democrat, June 8, 1880.

² Washington University, "Opening and inspection of the Man. Tr. Sch.," St. Louis Globe Democrat, June 10, 1880.

³ Catalogue, St. Louis Man. Tr. Sch., 1882-83, p. 5.

demonstration of the actual classroom work. Visitors were handed a copy of a program which announced:

On Thursday, June 16, 1881,

at 10 o'clock.

The exhibition will consist of—

1. Display of drawings made by students.
2. Display of shopwork made by students.
3. Singing by the school.
4. A class exercise in carpentry.
5. A class exercise in wood turning.
6. A class exercise in drawing.
7. A report by the director of the school.

You are very cordially invited to be present.

*These exercises will not last more than two hours.**

Everything about the building was in excellent order. The shops were unoccupied by students, but the tools and machinery were in shape for immediate use. On the third floor the work of the year was on exhibition. Hundreds of drawings showed both the industry and the success of the pupils. Some of the drawings of machinery looked like the work of old draftsmen. The exercises in shopwork occupied two rooms—one for carpenters, one for wood turning. The variety of forms and combinations showed that the alphabet of tools had been thoroughly taught. The visitors were exceedingly interested. Among the visitors the reporter noticed Colonel Jacobsen [later a prominent figure in the establishment of the Chicago Manual Training School] and Mr. Sullivan, ex-president of the Chicago School Board and editor of the Chicago Evening Journal.

The formal exercises opened with the singing of "To God on High" by the school, under the direction of Professor Morrison. In a report which Professor Woodward then read he pointed out that "the St. Louis Manual Training School had many forerunners, but it differed essentially from them all. It stands quite unparalleled on American soil." In commenting on the work done he said: "Progress in execution has not been as rapid as in appreciation of good work." After his address Professor Woodward turned to Doctor Elliot and the managers and asked for their orders. Doctor Elliot replied that the board were men of deeds rather than words, and asked that the exercises proceed.

After singing "Village Bells" 20 of the pupils were sent to the carpenter shop and 20 to the turner's shop. Mr. Bassett then proceeded to give his lesson. It consisted in dressing a piece of rough lumber and the making of a cross. Mr. Bassett worked and talked at the same time, and in a few moments full directions had been given. The class of boys got before him in their shirt sleeves with their apron on. The boys went to work with rough stock, and one finished in 26 minutes. The work was graded on the spot. As soon as the boys were well at work the engine started, and the visitors were invited to the turning shop. Mr. White then gave the class two exercises to turn from the rough. So great was the crowd that the reporter could not get within earshot of Mr. White, but the boys seemed to understand, and at a signal went to their lathes and began. Twenty lathes all in operation at the same time made the chips fly lively. * * * It was noticed that the ladies were much

* Program, filed with minutes, Managing Bd., St. Louis Man. Tr. Sch., Oct. 10, 1881, p. 21.

charmed with this exercise, and some of them expressed a desire to try their hand. . . . As spectators retired a Chicago gentleman said to Professor Woodward, "We shall not be ashamed to follow in your lead if only we can."

The second year of the school began September 12, '81, and closed June 14, 1882. A considerable number of the students of the previous year continued their course (42), and 4 newcomers joined the class. The incoming class numbered about the same as that of the previous year (61). Total registration at this time was presented to the readers of the school's prospectus for 1882 in the following manner:

THE CONSTITUENCY OF THE SCHOOL.

English-speaking boys will be received from whatever source, though the "Conditions of admission" must be strictly complied with. For the purpose of showing how widespread is the influence of the school, the residences of last year's pupils are given in the following table:

St. Louis.....	75	Arkansas.....	1
Missouri (not St. Louis).....	10	Tennessee.....	1
Illinois.....	12	Pennsylvania.....	1
Iowa.....	2	Vermont.....	1
Texas.....	2		
Mexico.....	2	Total.....	107

During the year of 1881-82, hundreds of visitors inspected the school and read its reports. Drawings and models were sought from far and near. At the urgent request of Col. Augustus Jacobson, whose name we found listed among the visitors to the school's first exhibit, Charles H. Ham, of Chicago, visited the school in April, 1881. Ham's favorable report of its work appeared in the Chicago Tribune of April 16, 1881, and led to the establishment (1883) of the Chicago Manual Training School.¹

Plans for enlargement followed this encouraging enrollment and manifestation of public interest. During the summer of 1882 Messrs. Conzelman and Sellow doubled the capacity of the school and greatly increased the convenience with which work could be done by erecting a 106 by 100 foot addition on Washington Avenue to house the recitation and audience rooms. The original building, which was used during the first two years, henceforth was devoted to the interest of shopwork. The contract for the new addition was signed May 8 and work was begun the following day. The building was completed the following September.²

¹ "Making hands' debt: A year's work at a manual training school." Missouri Republican, St. Louis, June 17, 1881.

² Prospectus, St. Louis Man. Tr. Sch., 1882-83, p. 9.

³ Ham, Charles H., "Educating the hand—St. Louis worthy of imitation on the subject of education by Chicago." Chicago Tribune, Apr. 17, 1881. See also Chicago Tribune, Feb. 8, 1882.

⁴ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Sept. 16, 1882.

In order that justice may be done to all who assisted in establishing the pioneer manual-training school which has done so much for the cause of practical education, there are listed here the names of those who helped purchase the second lot and who furnished the entire school with its equipment of tools. Most of these benefactors are no longer living, but their friends and descendants are entitled to the honor which certainly attaches to every benefactor of the school. They are as follows:

Charles S. Greeley.	Robert S. Barnes.	Thomas Richeson.
Wm. A. Hargadine.	A. F. Shapleigh.	Richard M. Scruggs.
William Barr.	Henry Shaw.	Henry W. Elliot.
Mrs. Henry Hitchcock.	John H. Maxon.	G. W. Simpkins.
John F. Beach.	Wm. E. Ware.	Ephron Catlin.*

In June of this year (1882) not only woodwork but blacksmithing was exhibited. Judging from the unusually minute press accounts of the proceedings of the day, the occasion must have fully met the expectation of the friends of the school. The visitors' interest in shopwork so exceeded their interest in recitations that public exercises were limited to showing the use of tools.¹⁰

The third year marked the full establishment of the curriculum as planned in the beginning. Anticipations in regard to the Russian system of tool instruction were reported in the prospectus of June, 1882, as being "more than realized."¹¹ As now arranged there were running through the entire course of three years five parallel lines of study—three intellectual and two manual. With but few and unimportant exceptions, the course consisted of prescribed studies; each student conforming to the course as laid down and taking every branch in its order. The arrangement of studies and shopwork by years is substantially as follows:

Course of study.

FIRST-YEAR CLASS.

Arithmetic, completed. Algebra, to equations.
English language, its structure and use. History of the United States.
Physical geography. Natural philosophy begun.
Drawing, mechanical and free-hand. Penmanship.
Carpentry and joinery, wood carving, wood turning, pattern making.
Latin may be taken in place of English and history.

SECOND-YEAR CLASS.

Algebra, through quadratics. Geometry begun.
Natural philosophy. Principles of mechanics.

* Minutes, Managing Bd., St. Louis Man. Tr. Sch., May 29, 1899, p. 203.

¹⁰ Mo. Republican, St. Louis, June 15, 1882; St. Louis Globe Democrat, June 15, 1882.

¹¹ Prospectus, St. Louis Man. Tr. Sch., 1882-83, p. 26.

¹² Catalogue, St. Louis Man. Tr. Sch., 1882-83, pp. 17-18.

English composition and literature. English history.

Latin may be taken in place of English and history if desired by the class.

Drawing, orthographic and isometric projections, lettering. Details of machines, tinting, free-hand drawing. Penmanship.

Forging, drawing, upsetting, bending, punching, welding, tempering, soldering.

THIRD-YEAR CLASS.

Geometry finished. Plane trigonometry and mensuration.

English composition and literature. History.

Elements of chemistry.

Bookkeeping.

Drawing, machine and architectural. Elements of descriptive geometry.

Work in the machine shop. Bench work and fitting, turning, drilling, planing, screw cutting, etc.

Study of the steam engine.

Execution of project.

French or Latin may be taken in place of English and history.

The actual framing of the curriculum so far as the shops and drawing rooms were involved is veiled in considerable obscurity. Before its makers were the accounts of the Russian, Della Voss, referred to in our sketch of the work done in the polytechnic shops of Washington University, and the parallel suggestions and shop-work photographs of the Massachusetts Institute of Technology that had appeared in the early reports of the Massachusetts Board of Education.¹³

Mr. Charles F. White, the first superintendent of shops at Manual, tells in a recent letter that he attended the Philadelphia Centennial in 1876 and examined the work of the Imperial Technical Institute of Moscow shown there, with no expectation, to be sure, of making specific use of what he saw. At the instance of Professor Denton he designed some months later a series of exercises adapted to the machine tools at Stevens Institute.¹⁴ With this experience in the background Charles F. White, during the eight years he was at manual, devised and arranged the series of woodworking and machine-shop exercises that were used with but few modifications throughout the history of the school.

It was Mr. Charles E. Jones, now instructor of manual training at the Ben Blewett Junior High School, and without doubt the oldest active instructor of manual training in America, who, during the early years of the manual-training school, "worked out, to illustrate the essential elements of his craft, a series of regular and carefully graded exercises well suited to the needs and capabilities of his class." Final formulation of the three years' drawing course was attained after several years of experiment by Mr. Harry Newington,

¹³ Twenty-fifth Centennial Prospectus, St. Louis Man. Tr. Sch., 1904, pp. 11-15.

¹⁴ Letter of Charles F. White to C. P. Coates, Sept. 14, 1921.

a young man who began teaching during his undergraduate days at Washington University.¹⁵

As originally planned—

the course of shopwork, in addition to the abstract exercises (which were designed to give certain practices and illustrate certain processes, actual tools or parts of tools), included boxes, cupboards, shelves, desks, easels, frames, etc., needed either in the shop or in the laboratories of the university.¹⁶

These were to be made as the classes became fitted for such practical work.

In all laboratory work, "no lively interest in some proposed construction" was allowed to obscure the student's view of the details of the work which must be mastered one by one.¹⁷

The first complete exhibit of work embodying the foregoing course of study was held June 13 and 14, 1883. At this rather pretentious affair both academic and shop work were featured. The character of the exhibit is best shown by the school program;

MANUAL TRAINING SCHOOL, JUNE 7, 1883.

PROGRAM.

Wednesday, June 13.

Exhibition of the year's work in free-hand and mechanical drawing from 10 till 3 p. m. From 10 till 12 the following class exercises: First-year class, divisions "Q," "R," and "K" in woodwork, "X," in algebra, "N" in history; second-year class, division "A" in forging, "B" in algebra; third-year class, machine-shop practice and chemistry.

Thursday, June 14.

Exhibition of drawings continued. From 10 till 12 o'clock the following exercises: First-year class, divisions "X" and "N" in woodwork, "Q" in Latin, "R" and "K" in natural philosophy; second-year class, division "A" in geometry, and "B" in blacksmithing; third-year class, setting up and running the class engines, presentation of diplomas and medals. At 12 o'clock the director's report in schoolroom, first floor.¹⁸

Five upright steam engines of about 5 horsepower each, the work of the students, were set up and run by the members of the graduating class. During the year 1882-83—

the second-year class forged over 100 tools for the turning shop, 70 for the machine shop, 46 tools for the forges themselves (including 40 pair of tongs), and other outside jobs, making a total of 280 tools or jobs, exclusive of the regular exercises.¹⁹

¹⁵ 5th Centennial Prospectus, St. Louis Man. Tr. Sch., 1904, p. 13.

¹⁶ Catalogue, St. Louis Man. Tr. Sch., 1880-81, p. 55. At the time the writer attended the school only blacksmithing tongs and carbon steel lathe tools used by third-year students were selected from this list of practical articles for student manufacture.

¹⁷ Woodward, C. M., *Manual Training in Education*, New York, 1890, p. 186.

¹⁸ Program of exercises filed with minutes, Managing Bd., St. Louis Man. Tr. Sch.

¹⁹ Catalogue, St. Louis Man. Tr. Sch., 1882-83, pp. 33-34.

The third year of the school closed June 14, 1883, with the graduation of its first class. Twenty-nine young men received diplomas and bronze medals.²⁰

In 1883-84 the number of students at the school attained a total of 201—the largest enrollment on record up to that time.²¹ Two small engines which were built by members of the first graduating class were exhibited at the local St. Louis Fair. The boys took premiums to the amount of \$50, six diplomas, and six silver medals.²² Mention is made of this seemingly trivial matter for, as we shall see, it was through exhibits that the theory of manual training was spread throughout the land. An account of this, the first exhibit in competition, was never published by the authorities. Significant in the notation in the directors' minutes is the remark "in competition," which may mean that the work was judged in competition with that done by mechanics. There were, of course, no rival manual-training schools existent at this time. It is possible that a special class was made by the directors of the fair and that, as a necessary consequence, the boys, being the only entrants, were also the prize winners. The unwillingness of the authorities to publish this incident is no longer explicable. In later years, at any rate, all public honors were recited in the annual catalogues.

In May, 1884, the first field trips for the purpose of studying the industries at first hand were arranged. The third-year class, accompanied by several of the teachers, spent a number of days inspecting the car works at Pullman, Ill., and the industrial plants in and about Chicago.²³ The early introduction of field trips in technical education is very striking. It has been said that Louis Agassiz was the first to employ instruction in the field, but in that instance attendance on field trips was voluntary. The manual-training school made attendance compulsory and extended the duration of such visits of inspection until they lasted several days. An interesting point, but difficult to work up, would be the history of the gradual introduction of "field trips" into most branches of instruction. Unfortunately, an opinion only can be expressed that this is an early example of the practice, without being able to illuminate it properly.

During the year 1884 the school lost two of its earliest and best friends in the deaths of two of its managers, Gottlieb Conzelman and Ralph Sellev. At the same time, through their liberality and the cooperation of Samuel Cupples, a member of the managing board

²⁰ Ibid., 1884-85, p. 6.

²¹ Ibid., 1884-85, p. 6.

²² Minutes, Managing Bd., St. Louis Man. Tr. Sch., Dec. 15, 1883, p. 67.

²³ Minutes, Managing Bd., St. Louis Man. Tr. Sch., May 8, 1884, p. 79; May 29, 1890, p. 204.

from the first, an endowment of \$115,000 to be fully realized in the course of five years was secured.²⁴ The managing board adopted the following resolution in memory of Mr. Sellew and his profound interest and liberality:

Resolved, That to perpetuate his name and the memory of his good works, a gold medal, to be known as the "Sellew medal," shall be awarded annually to that member of the graduating class who, in the opinion of the teachers and committee, stands highest in his class.²⁵

In June the first of a series of exhibits before the National Educational Association was made by the school at Madison, Wis. It attracted a great deal of attention and did much to arouse interest in manual training throughout the country.²⁶

The fifth annual catalogue (1884-85) contained the first statistics concerning the occupations of the graduates. From this it appears that Mr. Ralph Miller was the first graduate to become an instructor of manual training. He was called to Toledo, Ohio. to introduce the work there.²⁷

On February 12, 1885, Woodward reported to the board a formal invitation to present the subject of manual training at an educational conference to be held in Manchester, England, the following September.²⁸ This invitation he accepted. It is striking that at this early time, when the school was only 5 years old, it had already attracted foreign attention. Possibly the distribution of the prospectus in England by Samuel Cupples had stimulated this interest.

The first two classes had had no opportunity to study Latin. Consequently, when they sought to enter polytechnic schools or colleges they found themselves handicapped. To ameliorate this condition the authorities introduced the subject.²⁹ In so doing, they evinced for the first time a disposition to cater to the requirements for college entrance. Thereafter, studies regarded as distinctly preparatory to college were from time to time added to the curriculum.

In 1887 Woodward published his celebrated book *The Manual Training School*.³⁰ Of this, the first comprehensive account of manual training as a part of secondary education, mention will be made later.

Occupational statistics were published in the catalogue of 1888-89 to show that boys who had spent three years in the shops and classrooms were upon graduation "able to take no small part in the busy

²⁴ Catalogue, the St. Louis Man. Tr. Sch., 1884-85, p. 7.

²⁵ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Feb. 19, 1884, pp. 68-71. In awarding the medal the board took into consideration only character, scholastic and manual attainments. Cf. Bulletin 3, St. Louis Man. Tr. Sch., Aug., 1899, p. 2.

²⁶ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Apr. 10, 1884, p. 75.

²⁷ Catalogue, the St. Louis Man. Tr. Sch., 1884-85, p. 46.

²⁸ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Feb. 12, 1885, p. 86.

²⁹ Catalogue, St. Louis Man. Tr. Sch., 1882-83, p. 17.

³⁰ Woodward, C. M., *The Manual Training School*. (Boston), 1887.

world. Very young men are seen bearing heavy responsibilities, and bearing them well."²¹

During the year 1888 German was introduced as an elective.²² The late period at which it was taken up is striking from several points of view. In that day St. Louis was, of course, a pronouncedly German city. The German language had long been taught in the public schools. No one working in shops of the city's industries, and managing men therein, could have done so successfully without a speaking knowledge of German. The language was, so to speak, a commercial necessity. The delay in its addition to the curriculum shows how little the manual-training school modeled its courses after those already existing in the competing secondary schools and how independently its managers acted in consideration of their educational problems.

More effectively to spread the Russian system of manual training, exhibits of tool work and of drawing were sent (1887-1889) to the National Educational Association meetings at San Francisco, Kansas City, and Dallas, Tex.²³ The sudden increase in the number of such displays marks, obviously, the beginning of a wide interest in manual training—an interest that was not confined to American soil. Professor Parks, superintendent of school exhibits (American Group), notified Woodward that the St. Louis Manual Training School had been selected as the school to present the methods and work of a manual training school at the Paris Exposition of 1889.²⁴ The several framed specimens of tool work which were sent to Paris won the gold medal and were afterwards exhibited at the French Pedagogic Museum.²⁵ The same exhibit later was displayed at the Albany (N. Y.) Exposition and at the World's Columbian Exposition in Chicago. Pictures of a part of this display are reproduced from the original electrotypes.

In all probability the exhibit of the manual-training school was the finest of the sort. Such comparisons as have been made with other exhibits confirm this opinion. It presented a sequence of joinery, wood turning, forging, and machine-shop work in which the exercises advanced from the simplest processes to the most complex. The contrast with a modern school display is most striking. Not a single object could be put directly into use. The joinery exercises included halved joints, open mortise and tenon, blind mortise and tenon, mortise and tenon with relish, mortise and tenon with key, blind and open dovetailing, and mitered joints. But not one

²¹ Catalogue, St. Louis Man. Tr. Sch., 1888-89, p. 53.

²² Ibid., p. 5. See "Constituency of School," p. 26.

²³ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Oct. 19, 1888, p. 110.

²⁴ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Feb. 8, 1889, p. 121.

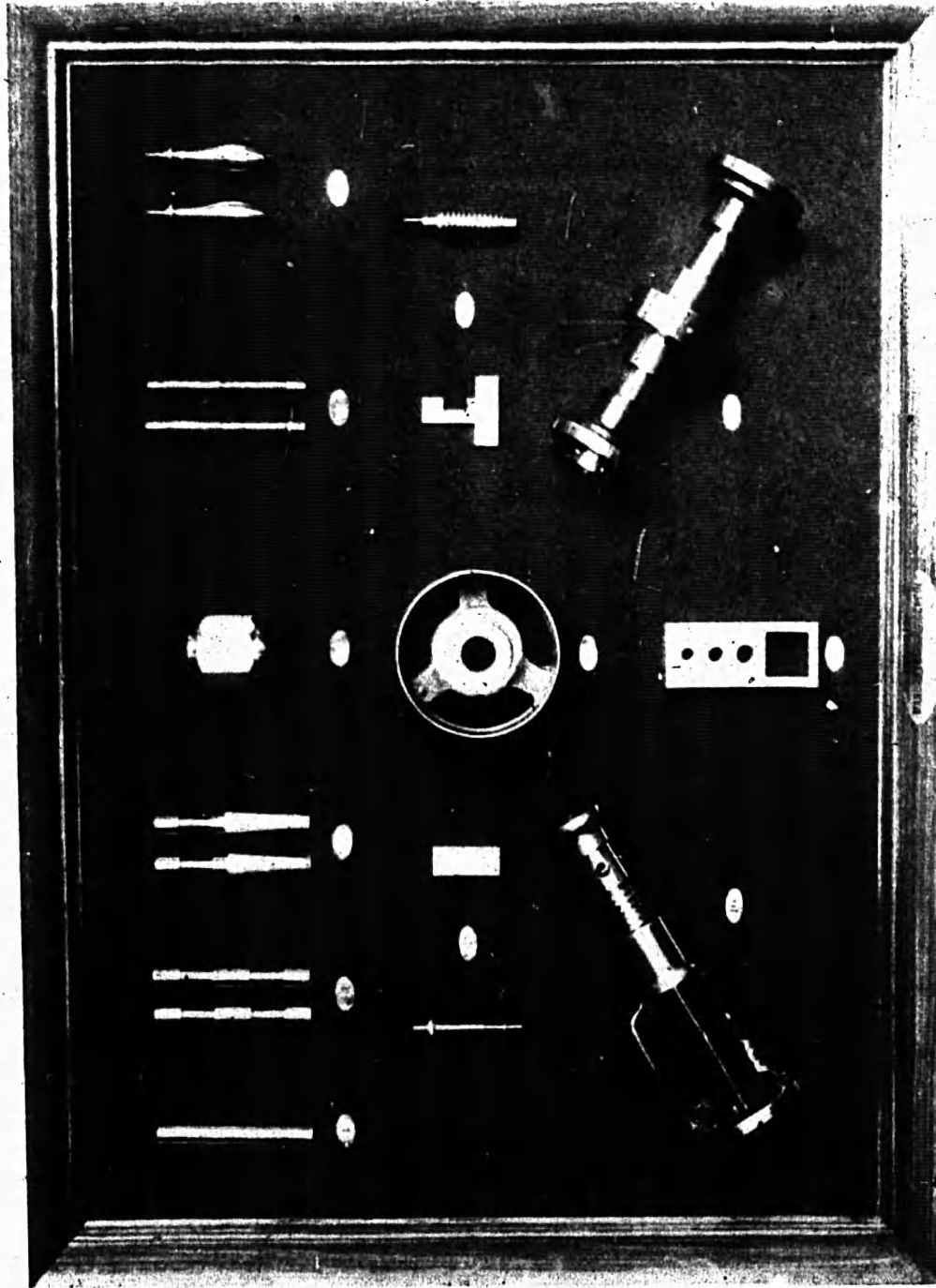
²⁵ Ibid., Nov. 16, 1889, p. 127.



NOAH DEAN AND A CORNER OF THE BASEMENT SHOP OF WASHINGTON UNIVERSITY, 1871.

BUREAU OF EDUCATION.

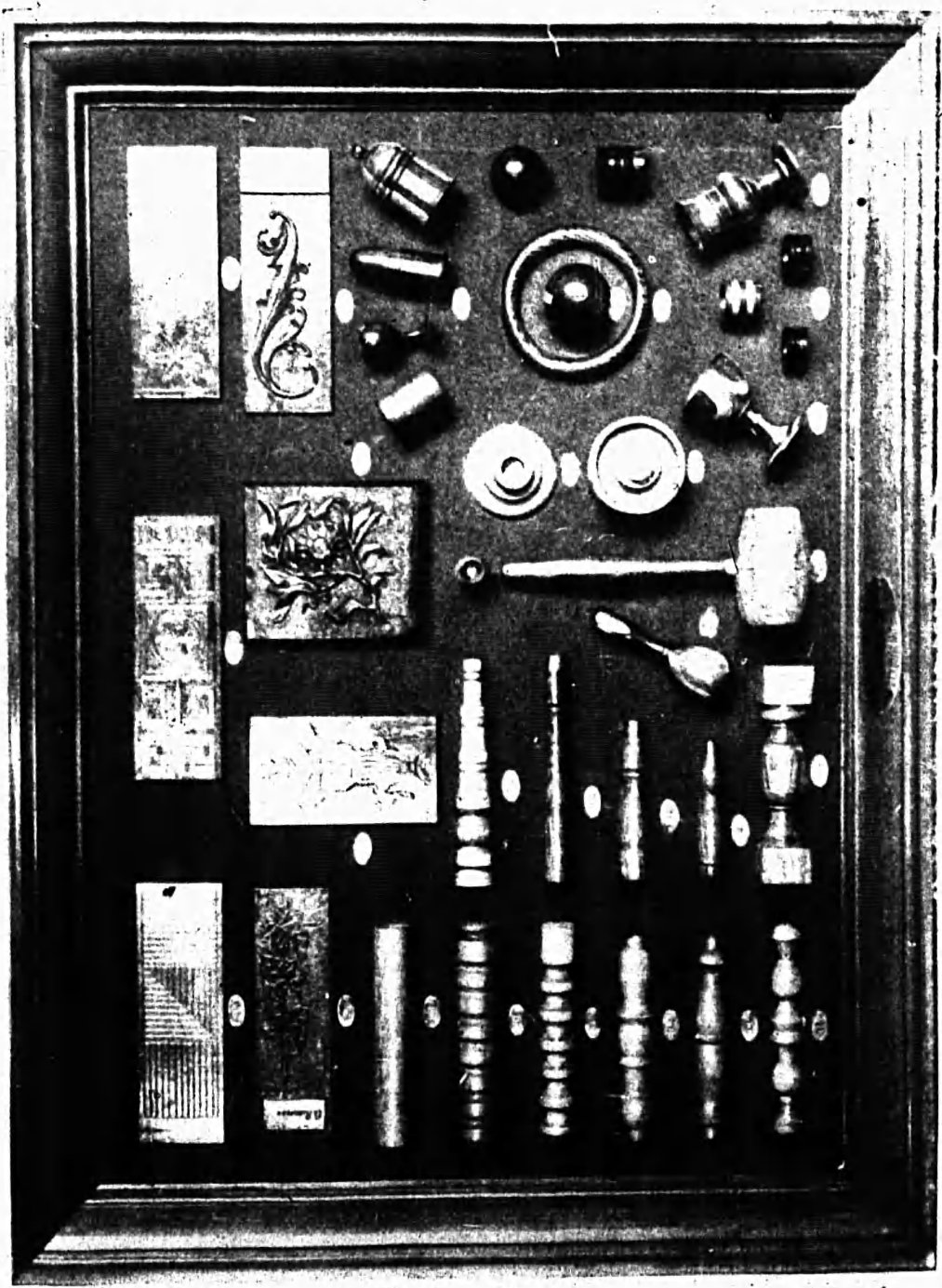
BULLETIN, 1923, NO. 3 - PLATE 6.



THE PARIS EXPOSITION EXHIBIT.

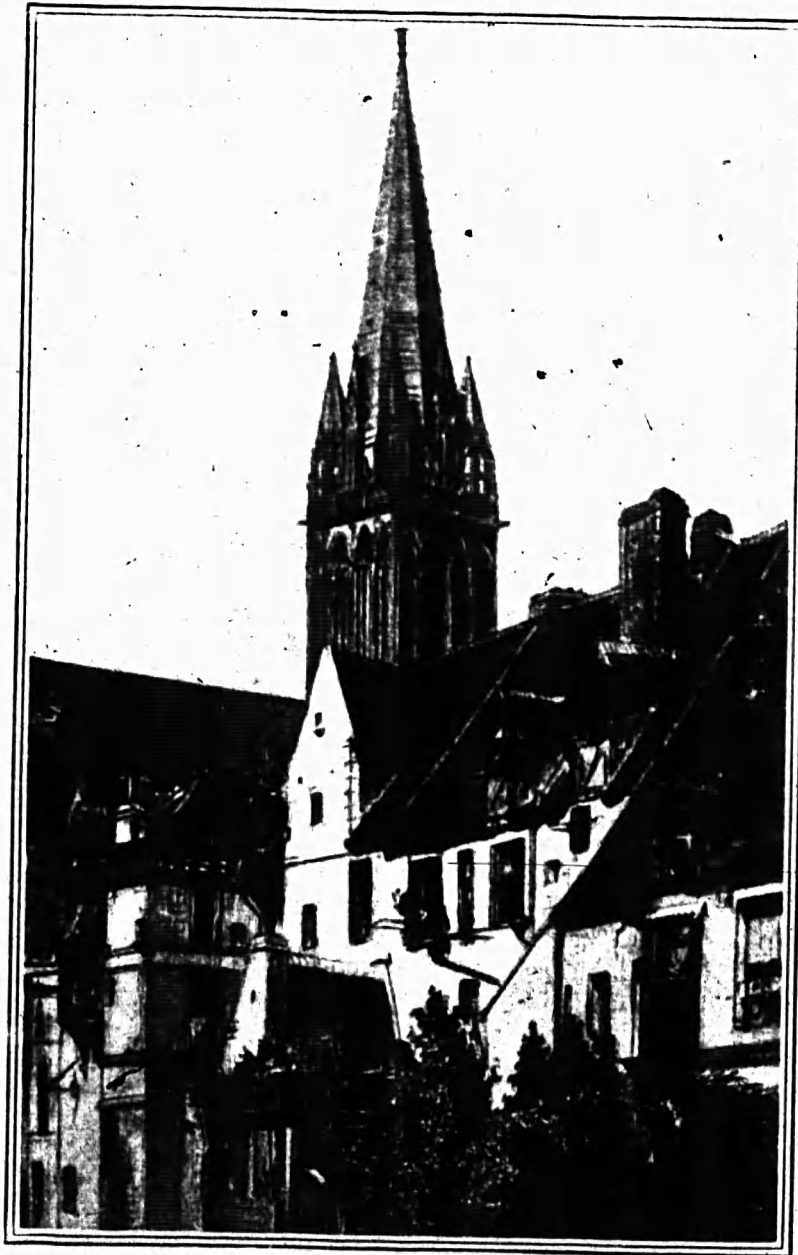
BUREAU OF EDUCATION.

PLATE NO. 3. 1903.



THE PARIS EXPOSITION EXHIBIT.

Examples of Work in Wood.



A DRAWING BY A STUDENT.

of these was illustrated except as something in and for itself. Not one was combined or employed to satisfy a utilitarian need. The same is true of the displays in wood turning and in machine-shop work. A glance at the illustrations of the wood turning shows cylinders, cylinders with V cuts and various geometrical curve cuts, ogees, etc., concluding in a climax of laminated goblets, napkin rings, and chuck work. The metal work was essentially the same, but it included a jackscrew, which perhaps alone of all the exercises was useful. The bent of the school is apparent. The student passes through an ingeniously graded series of exercises without ever turning his powers to actual use in creating something serviceable. Emphasis is always on the difficulty of the task and never on its utility. It must be granted that the display gave an excellent and easily grasped idea of what was done at the school. Anyone who studied it attentively would have been able to duplicate without great effort or serious error the characteristic shopwork of the manual-training school. On account of this fact great stress must be laid on the success of these displays in extending the influence of the system employed by Woodward.

In the early nineties Manual was the most popular secondary school in St. Louis, and "in every grammar school in the city the question of admission to it was eagerly canvassed." Up to the year 1889-90 "it had been carried on under an annual deficiency of from two to four thousand dollars." In the report quoted President Eliot continued:

It has contended with many difficulties incident to the organization and establishment of a new method in education, but its career, under the able management of its director, has been one of uninterrupted growth in patronage and in its endowment and in its facilities for instruction. Its income for the present year will for the first time relieve the university of any charge upon the general funds, and possibly contribute something toward reimbursements for amounts heretofore advanced."

In view of the increasing demand for admission during the summer of 1890, the managing board proposed and published the architect's plans for a substantial four-story addition to house the shops and drawing rooms. The impending financial panic of the early nineties, needless to say, caused the board's plea "to old and new friends to come forward and assist in carrying forward the work" to go unanswered and the enlargement plans to be abandoned."

Systematic instruction and practice in military drill was introduced in 1890 and featured in the catalogues of the next two years. Yet it appears from correspondence between the chancellor and the

"Special Report of the President, Submitted to Board of Directors of Wash. Univ., Dec. 5, 1889, p. 23.

"Circular, St. Louis Man. Tr. Sch., Mar. 10, 1891, filed with minutes, Managing Bd., Mar. 10, 1891, pp. 138-39.

commandant that drill was not enthusiastically embraced by the students. On one occasion, Lieut. J. W. Stafford, of the staff detailed for cadet work, reported "that in his opinion the boys themselves do not expect some of the excuses which they submit for their absence will be accepted in a good-natured manner."³⁸ Instruction in this branch was discontinued after June, 1895.

As might be expected, the several years of financial depression following the panic of 1893 left an indelible trace upon the records. The increase of tuition, the dismissal of teachers, and the decrease of salaries, together with attempts to popularize the school by circulars, by addresses, and by field excursions, all are recorded in these years.³⁹

The director thought that the introduction of the Spanish language would help draw students:

In the fall of 1897 he urged upon the managing board the propriety of preparing St. Louis boys to take part in the coming commercial intercourse with the Spanish-speaking republics and with Cuba. To this end they should learn Spanish rather than German or French. The proposition was approved, and the money needed to try the experiment for a year and a half was subscribed by Messrs. Samuel Cupples, R. S. Brookings, H. C. Haarstick, and E. C. Simmons. A class of 20 boys was organized in February, 1898, under the instruction of Mon. C. E. Arnoux, a French master of arts and accomplished linguist, who had spent several years in Spain. One of the interesting parts of the commencement program in 1899 was an original declamation in Spanish by one of the students.⁴⁰

Toward the close of the century "the school was sending more boys into higher and professional training than any other school in St. Louis."⁴¹ The inclusion of this remark showed a significant change in the attitude of the board, which had once sought to provide capable shop superintendents for the local industries.

In the spring of 1903 an event of great importance occurred. The lot on which the building stood was too small to conveniently admit of extension to accommodate increasing numbers of students, and the neighborhood was rapidly becoming unfit for their needs. It was decided to sell the building and move westward.⁴²

For some time the question of a plan for separate maintenance of the institution engrossed the thoughts of the authorities. In the spring of 1904 Chancellor Chaplin recommended a consolidation with Smith Academy, another preparatory department of Wash-

³⁸ Catalogue, St. Louis Man. Tr. Sch., 1890-91, p. 30, Letters of Lieut. J. W. Stafford, June 15, 1892, Archives of Wash. Univ.

³⁹ Minutes, Managing Bd., St. Louis Man. Tr. Sch., May 27, 1897, pp. 185-6; June 7, 1898, p. 195.

⁴⁰ *Ibid.*, Feb. 25, 1898, p. 193; Bul. No. 3, St. Louis Man. Tr. Sch., Aug. 1899, p. 3. Spanish was discontinued Jan., 1910.

⁴¹ Catalogue, St. Louis Man. Tr. Sch., 1897-98, p. 60.

⁴² The property was sold June 1, 1903, and a lease was taken until July 1, 1905; cf. Minutes, Managing Bd., June 9, 1903, p. 235.

ington University.⁴³ The managing board and the alumni association, however, were opposed to a merger. They memorialized the directors of the University to erect a separate building rather than to combine the school with another of less distinctive character.⁴⁴ The progress of these resolutions is best shown by a circular letter which was sent, two months later, to every alumnus:

ST. LOUIS, Mo., August 24, 1904.

You are doubtless aware that this fall the old school will compete with two new public manual-training high schools. They will offer fine new buildings in attractive localities, splendid equipment in shop and laboratories, and free tuition and books. This year the old school will offer its time-honored buildings and equipment; its corps of seasoned teachers, mainly men; its improved courses in shop and laboratory; its new four-year course of study, designed to meet the present rigid demands of engineering colleges; and its glorious tradition of 25 years of epoch-making endeavor. Next year it will offer as fine buildings and equipment as skill, money, and experience can produce, and exceptionally fine facilities for athletic sports and physical culture.

It largely depends upon the alumni whether we shall go into these new surroundings with the fragment of a school or shall go with the first three classes filled with their complement of 250 good, vigorous, ambitious boys.⁴⁵

Everything was sufficiently advanced to break ground for the new buildings on Monday, January 9, 1905. In the midst of a snowstorm, Woodward delivered the principal address. As the venerable director attempted to shovel the first spadeful of frozen earth, a wag in the crowd of invited friends good-naturedly shouted his well-known motto, "The skillful hand, the cultured mind." Humorous calls from the students also greeted the efforts of each instructor and alumnus who assisted in the ceremonies of breaking ground.

After the dignitaries had completed the formal part of the ceremony the students used football tactics in their eagerness to be the first to shovel. The shovel used in the formal breaking was made especially for the occasion by an alumnus.⁴⁶

The weather then became so inclement that it was nearly a month before the work of construction could be pushed in earnest. The speed with which the building was erected may be guessed from the fact that the school was able to leave its old buildings, with their historic interest, and to occupy the new structures in September, 1905, less than eight months after construction had really begun. With removal to the new site we find that the third-year boys in general remained to graduate, and that the first-year class showed the popularity of the school in the new district, while the loss in the second year showed most clearly the effect of the removal and

⁴³ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Apr. 20, 1904, p. 242.

⁴⁴ Ibid., pp. 245-46.

⁴⁵ Circular letter of principal, St. Louis Man. Tr. Sch., Aug. 24, 1904.

⁴⁶ "Ground broken in snowstorm for new manual-training school building in West End," St. Louis Globe Democrat, Jan. 10, 1905.

the competition of the two new municipal high schools. The school had been unable to bring all the second-year pupils out to its new location, as many of them lived in the vicinity of the public buildings.⁴⁷

For the purpose of setting forth connectedly the events of the opening years of the new century, no mention has thus far been made of the serious loss sustained by the school in the deaths (1904) of Edwin Harrison, chairman of the managing board of the institution since its establishment, and Principal George W. Krall. Both were notable benefactors; and while the latter did not give gold he gave what Woodward declared to be better—his faithful and enthusiastic service for over 20 years. For years this man had advocated the establishment of normal classes for the training of teachers in manual training. For years he urged changes in the curriculum that would have kept the pioneer institution abreast of the time and would have enabled it to compete with the more progressive public high schools.

It yet remains to record the events of the last decade of the school. There is no occasion to repeat in detail the statements which have been advanced to explain the gradual fall in enrollment, in prestige, and in influence. Their net import is that the decline may be ascribed to the cumulative effect of competition, the removal to an unsuitable location, the loss of the inspiring presence of Principal George W. Krall, the friction between faculty members, and the case-hardened tenacity in holding to an outgrown program.

In the spring of 1906 the managing board entertained a proposal for the admission of a class of Mexican boys. Nothing came of this, however, for several of the members were opposed to taking any responsibility for the well-being of boys outside of class hours.⁴⁸ Although these plans were abortive, they justify the insertion of a letter from Mr. E. C. Simmons to Woodward, one which every enthusiast for manual arts should read:

OCONOMOWOC, WIS., June 9, 1906.

There is no place that I know of where instruction such as the Manual gives is more needed than in Mexico, and no place more ready to absorb and make use of such instruction. Mexico, to me, is like a hungry boy looking for something to eat; her hunger is for knowledge, for education—eager to find out American ways and to adopt them. Ten years ago we could sell but few, if any, American tools in Mexico. Five years ago we divided the trade with England and Germany. To-day nine-tenths of the mechanics' tools that are sold in Mexico are made in the United States, and yet they don't know how to use them. They know they are better, but they don't know why. By all means get up your Mexican class.⁴⁹

⁴⁷ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Nov. 17, 1905, p. 257.

⁴⁸ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Dec. 13, 1904, p. 249; Apr. 7, 1906, p. 260.

⁴⁹ Letter of E. C. Simmons to C. M. Woodward, June 9, 1906; filed Minutes, Managing Bd., p. 260.

The records for the year 1906-7 show that a full-time instructor of athletics had been employed, that field trips which we have seen were an innovation at Manual were still featured, and that a course in automechanics had been introduced.⁵⁰

In June, 1908, the first 4-year class, numbering 19, was graduated with appropriate ceremonies. Woodward was absent, being a guest at the University of Wisconsin.⁵¹

Although declining in prestige, "Manual continued," as Woodward once said, "to be fortunate in its friends." In 1909 William Barr, founder of the mercantile firm of William Barr & Co., bequeathed \$100,000 to it. In the same year Robert Brookings, president of the Washington University Corporation, equipped the new automechanics shop.⁵²

On February 8, 1910, with great reluctance and after long deliberation, Woodward decided to tender his resignation of the deanship of the school of engineering and architecture and of the directorship of the manual-training school. In resigning, he declared that it was his desire during the next year or two to finish the preparation of a textbook which should be his last and best gift to students in applied mechanics. This statement was followed by a brief review of the progress made in the engineering department of Washington University during the 45 years he had been a member of the faculty. In closing he said:

While my chief interest has always been in the higher technical department, I have given no small amount of time and thought to the establishment and administration of the manual-training school. I am glad to believe that it has been a pillar of strength to the University.⁵³

With the removal by death of Samuel Cupples in 1912, Woodward's interest in the affairs of Washington University and in those of the manual-training school began to wane. Yet he continued to attend the rather infrequent meetings of the managing board until a few months before his death, January 12, 1914.

At the last adjourned meeting of the managing board, held March 18, 1914, it was—

Resolved, That to perpetuate Professor Woodward's memory and to commemorate his efforts in behalf of the development and spread of manual training, this board petitions the corporation of Washington University to change the name of the school to "Woodward Manual Training School of Washington University."

This resolution, it seems, was adopted unanimously; it was not, however, to be published until the corporation had acted upon it favorably.⁵⁴

⁵⁰ Minutes, Managing Bd., St. Louis Man. Tr. Sch., June 19, 1906, p. 264.

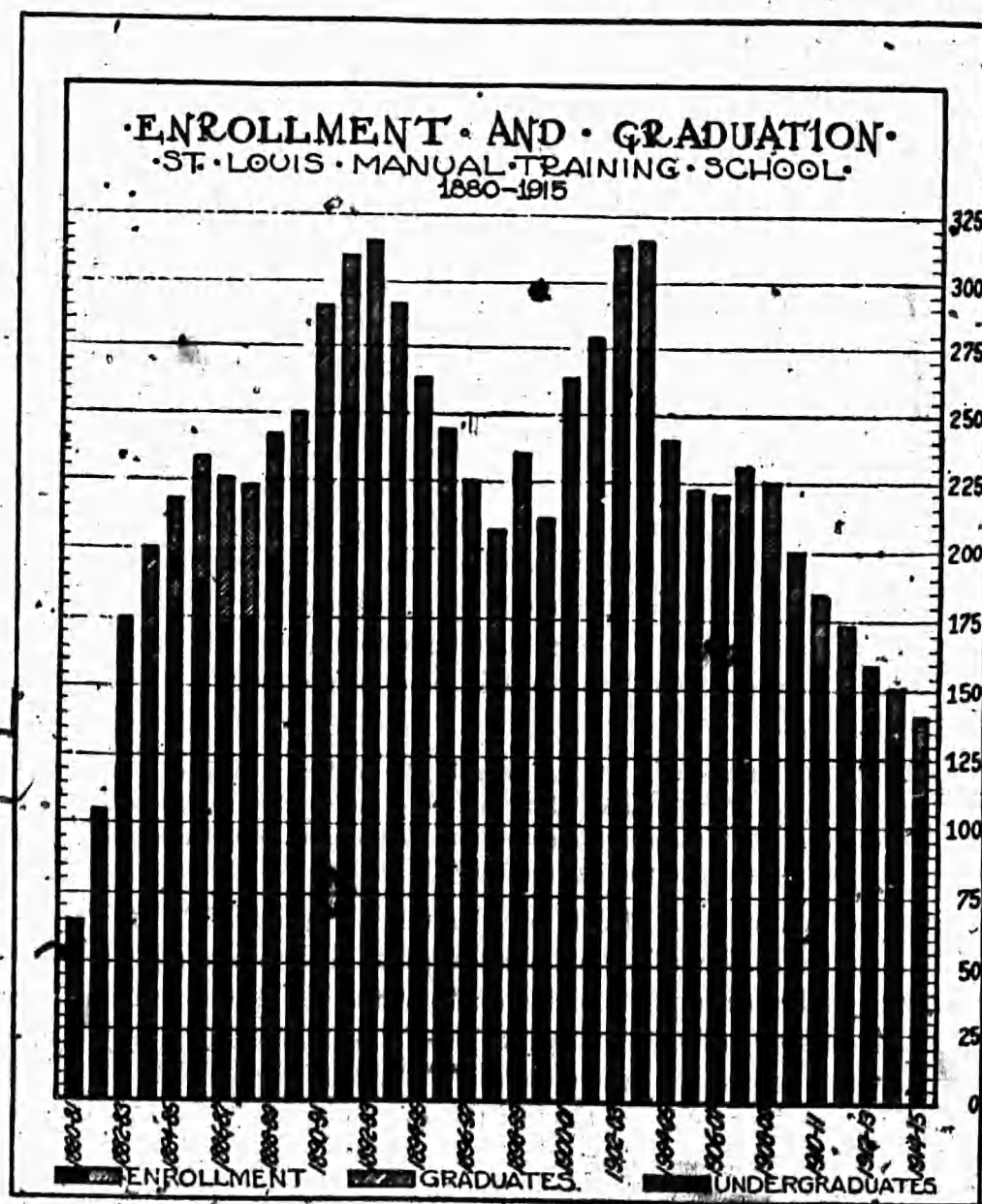
⁵¹ Ibid., June 30, 1908, p. 312.

⁵² Ibid., Apr. 14, 1909, pp. 318-19.

⁵³ Editorial, Student Life, Wash. Univ., vol. 34, No. 22, Mar. 9, 1910.

⁵⁴ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Mar. 18, 1914, pp. 345-46.

On February 5, 1915, the corporation of Washington University voted to unite Smith Academy and the manual-training school in one organization. The name of the new department was to be "Smith Academy—The Manual Training School."⁵⁵ The history of



The following points are significantly exhibited in this graphical representation: The large enrollment before the two great fairs (Chicago, 1893, and St. Louis, 1904), for which I can not account; the sudden and irreparable change in the fortunes of the school after its removal in 1905; and the surprisingly high mortality, for less than half of those entering remained to graduate.

this new organization is not germane to my subject, but it may be remarked in passing that on April 12, 1917, the patrons received a copy of the following document:

⁵⁵ Catalogue, Smith Academy Manual Training School, 1915-16, p. 9.

MANUAL TRAINING SCHOOL.

The manual training school was established in 1879 as a branch of the polytechnical department (now the school of engineering). While the ordinance establishing the school mentioned as at that time contemplated various kinds of instruction, emphasis was placed upon manual training as a necessary preparation for engineering courses, and the period of instruction was limited to three years. The ordinance specifically stated that instruction in the manual-training school should be extended to the students in any department of the university. During the operation of the school the length of the courses has been extended from three to four years and instruction has been given to both preparatory and undergraduate students.

As the demand from preparatory students has during recent years been fully supplied by the city high schools, the corporation, at its meeting March 30, determined to modify still further the instruction given by the school, confining its services to the undergraduate departments after the expiration of the present academic year. The manual-training school, commencing with the autumn semester, will in future give its instruction at the manual-training shop on the university campus.

E. A. ENGLER,

Secretary to the Corporation.

APRIL 12, 1917.

Enrollment and graduation statistics, 1880-1915.

School year.	Enrolled.	Graduated.	School year.	Enrolled.	Graduated.	School year.	Enrolled.	Graduated.
1880-81.....	67	1893-94.....	292	51	1906-7.....	220	18
1881-82.....	107	1894-95.....	264	63	1907-8.....	232	19
1882-83.....	176	30	1895-96.....	244	38	1908-9.....	227	36
1883-84.....	201	30	1896-97.....	226	32	1909-10.....	200	24
1884-85.....	218	40	1897-98.....	208	42	1910-11.....	180	26
1885-86.....	233	45	1898-99.....	234	36	1911-12.....	174	23
1886-87.....	226	52	1899-1900.....	214	38	1912-13.....	161	20
1887-88.....	223	47	1900-1.....	264	49	1913-14.....	153	22
1888-89.....	241	42	1901-2.....	270	48	1914-15.....	141	20
1889-90.....	249	46	1902-3.....	314	48			
1890-91.....	289	57	1903-4.....	316	60			
1891-92.....	310	60	1904-5.....	241	60			
1892-93.....	316	64	1905-6.....	218	51			
						Total.....	7,864	1,346

²² Also appeared as a paid advertisement. See St. Louis Globe, Apr. 4-5, 1917.

Chapter III.

THE INTERNAL ECONOMY OF THE SCHOOL.

ADMINISTRATION.

Unfortunately for us, in considering the administration of the school we are confined to such source material as minutes of the managing board, bulletins, catalogues, calendars, and press notices. No minutes of faculty meetings are available.

No large auditorium was provided in the early building, as Woodward felt that separate classes could be managed more easily and economically.¹ Students were grouped in divisions, according to their stage of advancement in school. Each of these divisions met in the "audience" or assembly room of the teacher in charge of the respective year's work. The first thing that was done in each of these rooms was the calling of the roll, which was facilitated by a seating arrangement. Regular morning exercises followed roll call. These at the time the writer attended the Manual (1899-1902) included, among other things, instructions regarding the practice of vertical penmanship. The practice was "to give every boy a copy-book of standard vertical writing and require ~~him~~ to study it and systematically teach himself [sic], and to copy the style in all his written work."²

Spelling drills and memory gems also found a place in these daily 10-minute sessions. The divisions were also used as a convenient means of lecturing the students concerning their health and conduct.³ The rules about leaving the building were very strict. Access to and egress from the premises could be had only on the principal's order. Doors and yard gates were securely locked during regular class periods. Among the first regulations we find the injunction that "pupils must keep their tools and benches in order." Detailed instructions were issued for the guidance of teachers and pupils.

While penned in by the great St. Louis tornado of 1896, Woodward edited the first of a short-lived series of bulletins issued by the school. In this one we are treated to a quaint little squib entitled,

¹ Published letter of C. M. Woodward to President Wm. G. Elliot, St. Louis, Feb. 27, 1892.

² Bul. No. 1, Manual Training School of Wash. Univ., Aug., 1896, p. 3.

³ Cf. Address of A. P. Greensfelder at the unveiling ceremonies of the G. W. Krall tablet, St. Louis, June 17, 1906.

"How to get out of the manual." Inasmuch as this document illustrates the sort of admonitions given to the students, it is printed in full. The effort at jocosity is Woodward's own, and one may very reasonably question its effectiveness.

HOW TO GET OUT OF THE MANUAL.

There are several ways:

First. Let the boy complete the course of study and practice and get a diploma. Then he will be a member of the alumni association for life and he will be unceasingly grateful to his parents for sending him to the Manual.

Secondly. He can neglect his work, waste his opportunities, and so forfeit his place.

Thirdly. He can cheat at examinations, act out lies to teachers and classmates, and aim to get credit for work he does not do. This will surely put him out. It may take a little time to find out what a worthless, deluded trickster he is, but persistent effort along those lines will earlier or later secure expulsion.

Fourthly. He can be ill-mannered, impudent, unjust to everybody, and full of complaints at the partiality of teachers. This method is slow, for he will be encouraged to mend his manners, his speech, and his judgment; but if he refuses to improve, everybody will soon tire of him and his father will be urged to withdraw him.

The only one of these ways for getting out of the manual-training school which is highly recommended is the first one. All the others (we are sorry to say) have been tried in the past, but those who have tried them are not proud of their performances, and they do not commend them to others. The first way is justly popular. It results every time in a splendid, all-round training, valuable in every walk in life, a sturdy loyalty to the school, and a warm friendship for all the teachers.⁴

From the earliest beginnings Manual repudiated the *in loco parentis* theory of school life. Its sponsors declared that the school was not an asylum for dull and lazy boys. The boy who wished to get rid of book study and to spend most of his time in the shops was advised to go elsewhere; so, too, the boy who was not willing to study five evenings per week at home.⁵ The heavy program of the three years' course prevented arranging study periods during school hours. The boys were deemed old enough to form habits of steady application and individual effort.⁶

With the passage of time we find a gradual amelioration of the regulation providing "that pupils who fail to make reasonable progress in their work will be dismissed." Those who failed to do their work well but appeared likely to succeed on a second trial were given a chance to redeem themselves in a lower class.⁷ In the declining years of the school it became possible for "a pupil with a few

⁴ Bul. No. 1, St. Louis Man. Tr. Sch., Aug., 1896, pp. 8-9.

⁵ Calendar, St. Louis Man. Tr. Sch., 1901, p. 2.

⁶ Catalogue, St. Louis Man. Tr. Sch., 1905-6, p. 48.

⁷ See catalogues, St. Louis Man. Tr. Sch., 1880-81, p. 26; 1899-1900, pp. 37-38.

scattered conditions" to be carried along with his class to the end of the term.⁸

For the third, and so far as discovered the last, of the bulletins published by the school, Woodward prepared a half-page article denouncing "The nicotine habit." In this article he raised the query: "What would the great body of manual-training school alumni say to a proposition to restrict all Manual scholarships to those who avoid the use of tobacco in any form?" He regretted that there were a few who smoked behind the great chimney attached to the school, or in the street; but declared that the vice of smoking was not a common one at manual. He enjoined caution on the part of the school authorities to eliminate representatives of the "rowdy element—the element that apes the sport, that stamps and whistles and screams at public exercises, that visits low theaters and copies their style and slang."⁹

Discipline, however, was never a real problem at the Manual. While the records show a few instances of suspension for cheating, theft of lunch checks from the dining hall, and the like, the morale of the student body was on the whole very high. The minutes of the directors' meetings bear witness that the regulations in regard to the removal of all conditions before graduation were very rigidly enforced. In not a few instances were the names of candidates for diplomas withdrawn after publication in the graduation announcements.¹⁰ One rather remarkable case—the presentation of a diploma to a student who had left the school 10 years earlier and "who," it was shown, "had actually done all the work of the school though present only one year"—is recorded; but its significance escapes me.¹¹ Hard work was traditionally expected and required of the students. The course at Manual was a long grind, and was so regarded by the school boys of the city.

STUDENT ACTIVITIES.

From the very beginning of the school it was the policy of the faculty to encourage all forms of student activity which benefited the student and which maintained an enthusiastic school spirit.

The Everett Literary and Debating Society, composed of the older students of the school, had for its object "mutual improvement in elocution, composition, and debate." It was organized very early in the school's history. During the brief period in which a music master was an adjunct to the faculty considerable music was heard within the walls of the old school. A glee club was organized as early

⁸ Catalogue, St. Louis Man. Tr. Sch., 1908-9, p. 67.

⁹ Bul. No. 3, St. Louis Man. Tr. Sch., Aug. 1899, p. 3.

¹⁰ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Apr. 9, 1907, p. 173.

¹¹ Ibid., Mar. 20, 1891, p. 214.

as 1883. At various times a mandolin club, and even a cornet band, were reported. The first and, so far as the records reveal, the only dance given by the boys was in February, 1902. The social affairs are interesting, in that they show the influence of the university on the school life. Glee and mandolin clubs, bands, and dances were, in the 20 years preceding 1902, characteristically the enterprises of college students.¹² Their existence at Manual speaks, furthermore, for a strong *esprit de corps* and a high degree of organization in the student body.

The school was without gymnasium or campus of its own until 1905. Prior to this time the athletic association devoted its energies to the formation and maintenance of interscholastic teams. A handball court and a basket-ball court were constructed in the rear of the building as early as 1901.¹³ One of the features of the last manual training school building site was a large athletic field. It was—

designed to afford a place for every form of outdoor sport with the smallest possible tax upon the time and energy of those who participated. A quarter-mile running track encircled the space used for the baseball diamond or the football field in season.¹⁴

Football, however, never met with the approval of Woodward. His rather pronounced views on the subject were contained in a circular letter which he caused to be placed in the hands of the several high-school principals of the city:

One great objection to the Rugby game, so called, is that so few care to play at it or are permitted to play. A small number of boys who are exceptionally large and strong or fleet, and sufficiently ambitious for athletic honors to face all dangers, monopolize the game, while the vast majority look on or stay away. The atmosphere developing in Rugby football to-day, including the professional coach, the hired trainers, and a sprinkling of sports always on hand, is decidedly bad for boys; tending to betting, to rudeness, and to an undesirable appetite for matched games involving personal contest and personal contact.¹⁵

One of the features of the school was the plan of week-end excursions to the surrounding industrial cities and of afternoon visits to local manufacturing plants. Before stringent Federal statutes governing free transportation were enacted—

through the kindness of railroad officers, engineers, commissioners, and business men in general, both professors and students of the several departments of

¹² Minutes, Managing Bd., St. Louis Man. Tr. Sch., p. 67; *ibid.*, Jan. 11, 1901, p. 211; catalogues, St. Louis Man. Tr. Sch., 1883-84, p. 22; 1905-6, pp. 49-50; "Manual training school boys give first dance," St. Louis Republic, Feb. 22, 1902.

¹³ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Jan. 11, 1901, p. 211.

¹⁴ Catalogue, St. Louis Man. Tr. Sch., 1904-5, p. 35.

¹⁵ Circular letter of C. M. Woodward, president Bd. of Ed., to St. Louis H. Sch. principals, St. Louis, Oct. 21, 1905. See also Woodward, C. M., *The Science of Education*, Proc. Am. Assn. for the Advancement of Science, 57: 353, Dec., 1906.

Washington University had free transportation over railroads on expeditions for scientific purposes.¹⁸

Upon several occasions the Pullman Car-Shops and the industrial plants in and about Chicago were visited. Trips to Crystal City, Mo., to Granite City and Alton, Ill., were annual affairs.

In June, 1906, the graduating class issued the first illustrated yearbook attempted at the school. It was a book some 8 by 10 inches, embellished with the class colors and dedicated to Woodward. The first great difficulty which the pioneer yearbook editors encountered was—

the accumulation of a sufficient fund to make the publication a possibility. But through the loyalty of many of the alumni, the kind assistance of their friends, and the unanimous support of the class, the editors were able to accomplish their purpose.¹⁹

In this little book of some 40 pages the students—

endeavored to give to the outside world some account of the little tragedies and comedies of their school-life, to bring to each alumnus some memories of his student days, and to preserve for each member of the class that which will serve in years to come as a pleasant reminder of "Old Manual" and the class of 1906.

The book contained pictures of members of the faculty, of the class, of the societies, and of the various athletic teams. Detailed sketches accompanied the various pictures. After 1906 such publications became a feature of the school.

A characteristic and unusual school enterprise was the preparation by members of each graduating class of a design to be engrossed on the school's graduation announcements. It was customary for the faculty to require of each graduate an original design symbolic of the novel features of the instruction given at Manual, and to select from these the best for publication. The only one found is reproduced here.

THE ALUMNI.

The following tabulation of the occupations of the graduates is the result of a great deal of labor. It does not follow the rather unsatisfactory subdivisions employed in the lists in the school's catalogue for 1909-10, the last statistics issued by the authorities.²⁰ It has been made up directly by a systematic study of the last roll of the alumni association, that of 1914. The catalogues of the school published after 1910 contained for some reason no occupational statistics. In submitting the tabulations it is fully realized that it

¹⁸ Supplementary catalogue of Wash. Univ., with a general description of apparatus used and methods of instruction followed. St. Louis, 1871, p. 40.

¹⁹ Yearbook, St. Louis Man. Tr. Sch., 1906 (foreword).

²⁰ Catalogue, St. Louis Man. Tr. Sch., 1903-4, p. 67.

was a very difficult matter for the school authorities to gather trustworthy data for accurate statistical statements concerning occupations. Graduates are prone to be interested in making a good showing. Moreover, very often in the mind of a questionnaire respondent no clear line of demarcation may be drawn between the vocation of "draftsman in an engineer's office" and that of the vocation of technical engineer, etc. Again, it should be borne in mind that the full influence of the school is to be learned only by following the careers of all who have for a longer or a shorter time been under its influence. It is not an easy task to review the success or failure of the graduates and by that means to arrive at an appraisal of their influence, but this has been attempted. To survey the non-graduates, who numbered more than half of those attending the school, is obviously entirely out of the question. The names are not available in any readily usable book, and would have to be compiled laboriously from the lists in the catalogues. Once the list was compiled, it would be a superhuman task to estimate their influence on the educational life of the community. The number of such nongraduates is, however, so considerable that the possibility of their influence should be remarked.

Occupations of graduates.

Accountant	1	Engineers, technical	128
Advertising	6	Estimators	6
Agriculturists	28	Foremen	8
Amusements, managers	6	Garage proprietors	5
Architects	24	Insurance agents	15
Army and Navy officers	4	Inspector, boiler	1
Artists	3	Inspector, mech. work	9
Bakers	2	Lawyers	34
Bankers	4	Machinists	13
Bookkeepers	12	Managers, assistant	15
Brewers	2	Managers, department	11
Brokers	11	Managers, district	9
Cashiers	10	Managers, general	27
Cashiers, assistant	3	Managers, insurance offices	6
Chemists	12	Managers, sales	19
Clerks	63	Manufacturers	81
Contractors	22	Mechanics	9
Dentists	66	Merchants	57
Draughtsmen, chief	9	Ministers	4
Draughtsmen	78	Physicians	26
Druggists	5	Patent examiner	1
Electricians	10	Principals, school	5
Engineer, locomotive	1	Printers and publishers	7
Engineers, naval	3	Railroad conductors	4
Engineer, stationary	8	Railroad officials	1

Railroad station agents.....	2	Teachers, manual training.....	34
Real estate brokers.....	22	Teachers, unclassified.....	14
Reporters.....	2	Tellers.....	3
Salesmen and agents.....	94	Unknown.....	60
Students.....	63	Dead.....	98
Superintendents, plant.....	53		
Surveyors and inst. men.....	10	Total.....	1,358

An inspection of this table discloses certain facts: First, it represents many professions; second, the largest number of graduates are engaged in pursuits in which a knowledge of the manual arts is basic; third, a very inconsiderable number are engaged in teaching manual training, one for each year of the school's life; fourth, a large number report themselves as being engaged in vocations seemingly nontechnical. Yet we may perhaps fairly say that manual training functioned in their cases to the extent of showing unfitness for technical pursuits.

In June, 1883, 30 graduates formed the nucleus of what soon became the alumni association of the manual-training school of Washington University. The first reunion and alumni banquet was held at the Planters' House in St. Louis on June 12, 1888. At this gathering over 100 of the 239 graduates of the school were present.¹⁹ The alumni organized by the election of H. Reed Stanford (now rear admiral of the United States Navy), of the class of 1884, for president; George T. Thompson, of the class of 1884, for secretary. For vice presidents an alumnus was selected from each of the classes that had graduated from the school.²⁰

By an ordinance of the corporation of Washington University, a voice in the management of school affairs was granted June 12, 1896. By this arrangement one member of the managing board of the school was to be elected by the alumni at its annual meeting. "As the election was for one year and the member not eligible to succeed himself, the selection at the annual election was certain to be a matter of considerable interest. Candidates were usually from the older classes." As this action of the university is one of the earliest (if not the earliest) instance on record of granting to the alumni of a preparatory department of a university representation upon its managing board, the documents are quoted in full:

ELIOT RESOLUTION.

Whereas the members of the alumni association of the manual-training school have frequently shown their affection for their alma mater, and wishing to manifest their interest in all that pertains to her welfare, have expressed, through the officers of the association, a desire to become more closely and

¹⁹ The graduates organized at the suggestion of Woodward. His plans for organization were printed in a circular of May 28, 1888.

²⁰ Catalogues, St. Louis Man. Tr. Sch., 1888-89, p. 65; 1889-90, p. 64.

more actively connected with the work of the school, and with this object in view have requested that the alumni may be represented in this board of control by the election of one of its members to serve as a member thereof: Therefore,

Resolved, That the board of control, believing that such an addition to the board would be of great advantage to the manual-training school, does hereby recommend to the board of directors of Washington University that the ordinance providing for the board of control be amended so that the board may be composed as follows:

Four members who shall be members of the board of directors of the university, two members who shall be persons not members of the board of directors, and one member who shall be elected by the alumni association from their own number to serve for one year from the date of his election or until his successor is duly elected; but the alumni member shall not be eligible for an election to succeed himself.

JUNE 12, 1896.

At a meeting of the board of directors of Washington University held June 11, 1896, the request of the alumni association of the manual-training school was granted; and it was resolved that the managing committee of the manual school shall hereafter consist of four members, who shall be members of the board of directors of the university; two members who shall be persons not members of the board of directors; and one member who shall be elected by the alumni association from their number, to serve for one year from the date of his election, or until his successor is duly elected. But the alumni member shall not be eligible to succeed himself. The chancellor of the university was also made a member of the managing committee of the manual-training school.

GEORGE M. BARTLETT, *Secretary*.²¹

THE FACULTY.

In the fall of 1880 the corps of teachers, not counting Director Woodward, numbered six gentlemen. Two of these, Messrs. White and Spargo, gave their entire time to the work of instruction. The other four, Messrs. Krall, Holloway, Bassett, and Morrison, were part-time instructors—each giving 10 or 15 hours of instruction per week.

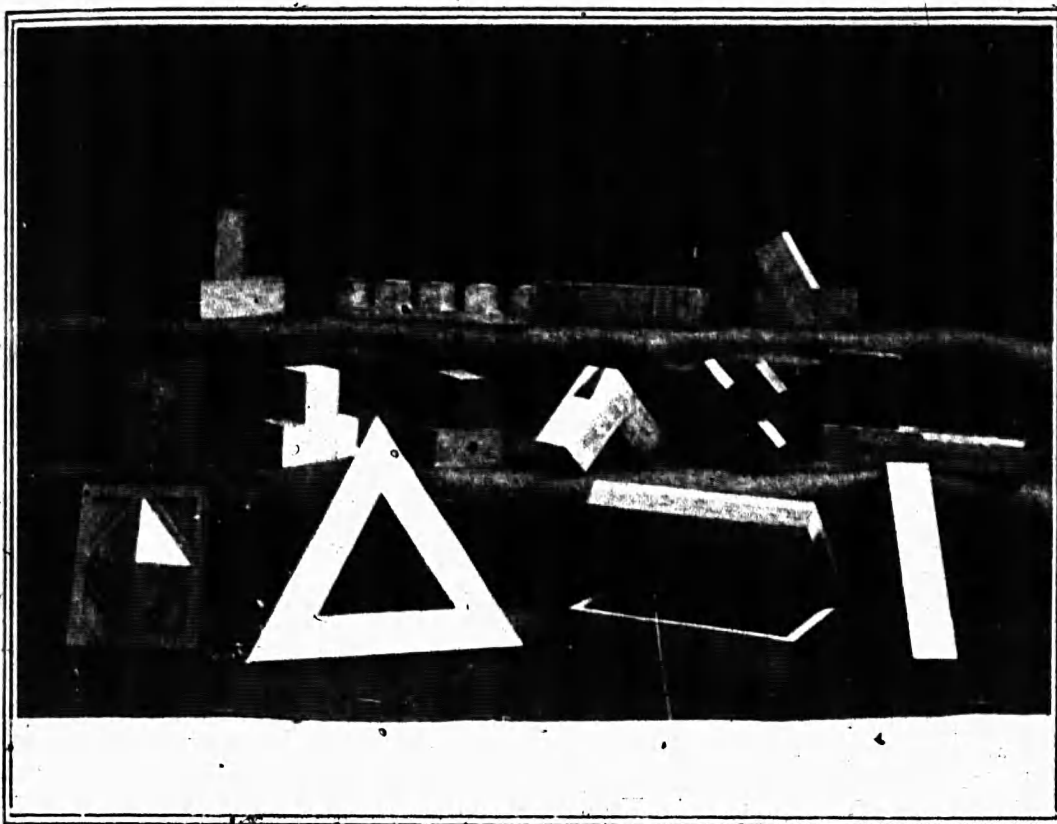
By way of general comment the following points seem to be of interest: Woodward selected for his faculty academically trained men rather than skillful mechanics. His firmly fixed opinion in this regard appeared in one of the last articles he wrote:

I have learned, perhaps unjustly, to distrust as a teacher a man who began by being a mechanic. He generally finds it hard to understand what it is all for. He got his own training under other conditions and with so different ends in view that it is almost impossible for him to view the work from the right standpoint.²²

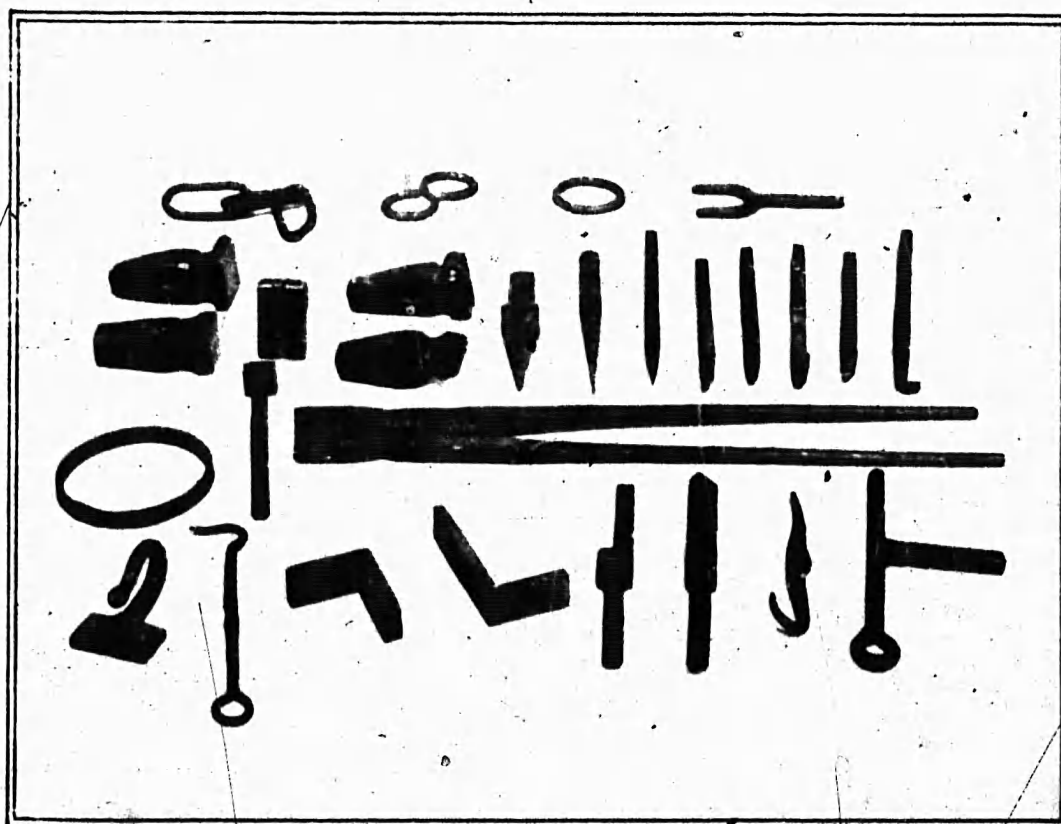
²¹ Minutes, Managing Bd., St. Louis Man. Tr. Sch., June 17, 1896, pp. 179-183.

²² Woodward, C. M., *Manual Training, Theory and Method*, Outlook Mag., 81: 929, 1905; see also, Woodward, C. M., *Manual Training in Grades and Colleges*, Nat. Educ. Assoc., 1905: 265.

It is worthy of note that for the first instructor, Charles F. White, he applied to one of the leading technical schools. John W. Spargo was a graduate of Washington University. George W. Krall had been educated in a normal school and had conducted classes for the training of teachers. Charles E. Jones alone seems to have been selected for his practical deftness. Although it is difficult to make comparisons, it is fair to say that the manual-training school set from the beginning a very high standard in choosing its instructors.



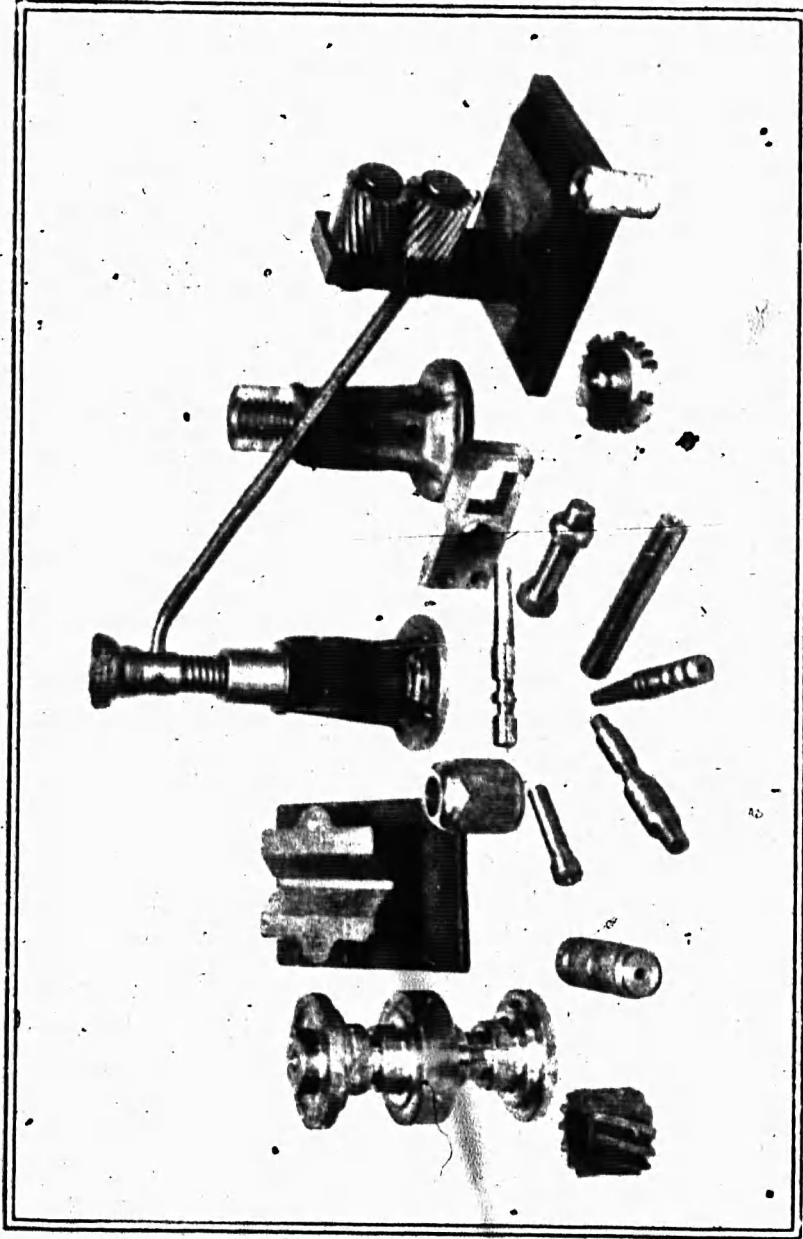
1. RUSSIAN SYSTEM EXERCISES, NO. 1



2. RUSSIAN SYSTEM EXERCISES, NO. 2

BUREAU OF EDUCATION.

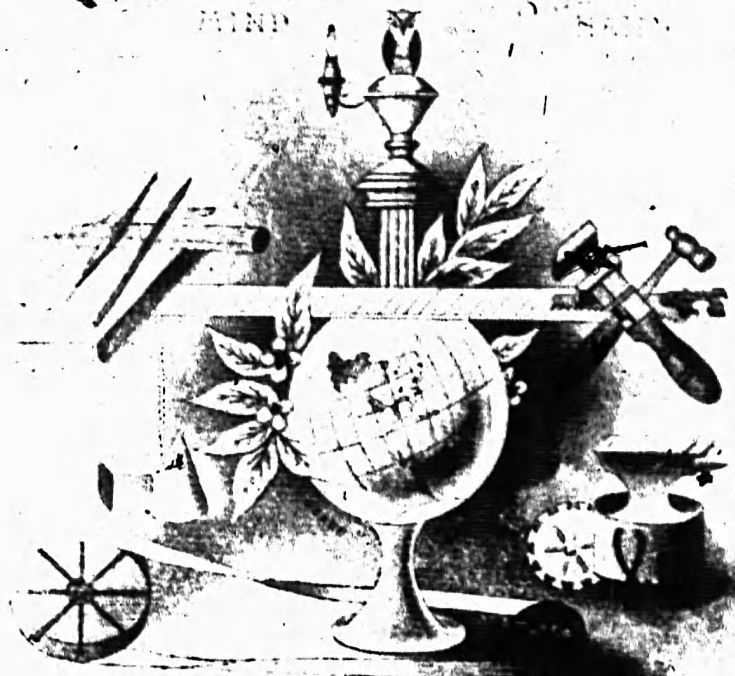
BULLETIN, 1933, NO. 3, PLATE 19



REPAIR SYSTEM EXERCISE

DEPT. OF EDUCATION

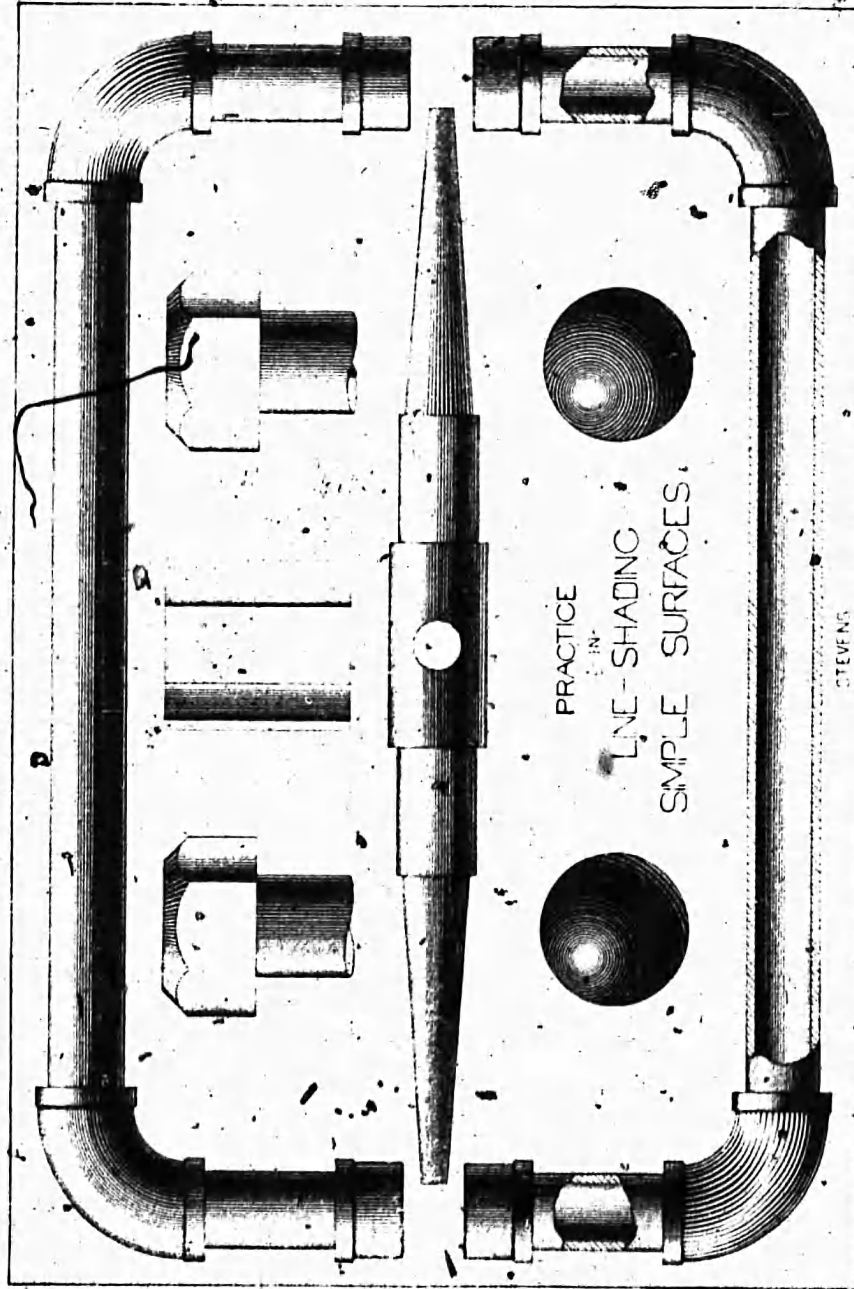
BULLETIN NO. 3, PLATE 11



A DRAWING BY A STUDENT
Graduation Arrangement Plate.

BUREAU OF EDUCATION.

BULLETIN, 1924, NO. 2, PLATE 12



PRACTICE
IN
LINE-SHADING
SIMPLE SURFACES.

STEVENS

A DRAWING BY A STUDENT

Chapter IV.

EDUCATIONAL BACKGROUND OF THE FIRST MANUAL TRAINING HIGH SCHOOL.

Under this heading will be taken up the school from the point of view of the history of education. What were its more significant and influential antecedents, and what part did they play in shaping the concept in Woodward's mind? In what ways did his interpretation of the new theory of manual education change with experience? What did the school announce as its purposes and aims? With the scanty material at hand one can not fully answer all these questions. There is no time to trace elaborately the history of manual education; although that is apparently obscure and little studied.¹ A review will be made only of the publications which contributed in one way or another to the shaping of Woodward's idea as evinced by his reference to them. These will be arranged roughly in chronological order, inasmuch as it does not seem possible at this day to estimate their comparative importance to him.

As a New Englander, Woodward was familiar with the writings of Henry Barnard and with the descriptions of the "Boston Whittling School." During the year 1871 one of the numbers of Barnard's *Journal of Education* contained the following brief item:

Sir William Petty (1623-1687), the founder of the house of Lansdowne, was not only a valuable contributor to the science of political economy but by his *Plan for a Trades School*, published in 1647, is justly entitled to the credit of being one of the earliest writers in the field of technical education.²

The phrase, "Plan for a trades school," is a misnomer and does not appear in the original pamphlet or in the *Harleian Miscellany*, from which Barnard reprinted.³ What Petty outlined was a vocational school offering a liberal education in addition to craft and technical training. The scheme comprised not a few suggestions

¹ The only comprehensive essay on the subject is Clarke, I. E. (editor), *Art and Industrial Education*, Washington, 1884-1890. For many reasons this is very unsatisfactory. The fundamental assumption of the author that manual training was introduced after drawing, and as a consequence thereof, is obviously erroneous.

Cf. also Clarke, I. E., *Art and Industrial Education*, Monographs on Education in the United States, No. 16 (Louisiana Purchase Exposition), St. Louis, 1904.

² Editorial, *Barnard's Jour. of Ed.*, 22: 29, Jan., 1871.

³ Advice of W. P. (afterwards Sir William Petty) to Mr. Samuel Hartlib. *Harleian Miscellany*, 6: 141-158 (London), 1810.

that came to fruition in Woodward's Prospectus for a Manual Training School published in 1879. There is space here for but a line or two of the Petty contribution:

We wish, therefore, that the edutands [sic] be taught to observe and remember all sensible objects and actions; whether they be natural or artificial, which the educators must upon all occasions expound unto them. * * * That all children, though of the highest rank, be taught some genteel manufacture in their minority. * * * And all for these reasons: 1. They shall be less subject to be cozened by artificers. 2. They will become more industrious in general. * * * 6. It may engage them to be Meecenates and patrons of arts. * * * 8. As it will be a great ornament in prosperity, so it will be a great refuge in adversity and common calamity.*

The Boston Whittling School is sufficiently described in the following extract from a letter printed in the report of the committee on education of Rhode Island. This extract has to do with the first period of the school's life:

Boston, 1877.

Our "whittling school" has opened its jackknife every winter for five years. Thirty or forty boys from 12 to 16 years of age have belonged to it, and with the aid of jig saws, a turning lathe, and a few simple tools they have made brackets, match boxes, small chests, checkerboards, and such trifling things. We have accommodated the school in our chapel and found no difficulty in accomplishing the little thus described with portable work benches, etc. The value of such a school is not in the amount of skill the boys attain to but in the bent it gives their leisure hours. The boys say they do six times as much work at home as they do at the school.*

In the winter of 1876-77 the Whittling School united with the Industrial School, which had been conducted for two years in the Lincoln Building. The friends and supporters of both schools and others interested in the cause of industrial training formed an association called the "Industrial Education Society."† This group of people developed and maintained the combined school. The city authorities gave the use of a ward room on Church Street, a location with which the Boston Whittling School is always connected in any reference to the school;

The room was fitted up with workbenches, giving each boy a space for work 4 feet in length and 2½ in width. Each bench was provided with a vise with common wooden jaws and an iron screw, etc. Thirty-two boys of from 12 to 16 were admitted, and as the school was open only in the evenings, some of them attended public schools in the daytime. A course of 24 lessons in wood carving was prepared, with special reference to securing the greatest amount of instruction with the least expenditure for tools and materials.

* Advice of W. P. (afterwards Sir William Petty) to Mr. Samuel Hartlib. Harleian Miscellany. 6:144-145, 1647.

† Contemporaneous with the introduction of manual training into the polytechnic shop of Washington University (1872).

* Letter of Geo. L. Chaney to committee on education of the State of Rhode Island, public document, Appendix (12), report of the Com. on Ed. Acts, Resolves, and Reports of the Gen'l Assembly, Jan. session, 1877, p. 28.

* Rep. Mass. State Bd. of Educ., 1875-77, pp. 193-94.

"The object of the school," said the committee who formulated this report, "was not to educate cabinetmakers or artisans of any special name, but to give boys an acquaintance with certain manipulations which would be equally useful in many different trades."⁸

The report just quoted has been so often commented on in connection with the rise of manual training and is so familiar that attention will be called only to one extremely important matter which has not received the emphasis it ought to have received. Apparently the Boston Whittling School should be considered as two schools, not merely because of the administrative change involved, but also because of the fundamental shift in the educational outlook of its projectors. Originally, judging on the basis of the letter of 1877, its aim was to give the students wholesome and enjoyable work of a type in which they would normally engage. The value of the training rested, it is clear, in the activity and not in the tool process. A complete change occurred when the Boston Whittling School came under the influence of the Industrial Education Society. This society had learned to know the theories of Della Voss, and then the object of the course offered was declared to be instruction in the fundamental manipulations of tools.

The goal of the new venture was epitomized in the hackneyed catchwords, "instruction and not construction."⁹ Its attitude changed from the practical to the theoretical. The school no longer called upon the constructive instinct of the child. Obviously, Woodward's references to the Boston Whittling School had to do with the later stage. He did not appreciate the beginnings of the school which incorporated a notion of educational psychology entirely different from that proposed by him. Due to his leadership, the theory outlined in the earlier account was rejected by the pioneers in the great manual-training movement that followed the educational conventions of the late eighties. The student of recent educational literature will see at once that the fundamental principle of the early stage of the Boston Whittling School is the one now advocated. The pupil is regarded as embodying a bundle of instincts the teacher must put to use. Professor Meriam formulates this admirably in his stimulating chapter on handwork: "Handwork may be assigned an important place in the curriculum because it is a wholesome activity in which most children normally engage."¹⁰ Modern educational theory, based on a better knowledge of the

⁸ Wickersham, J. P., Rep. State Supt. of Schools. Pa., 1877, p. XXI.

⁹ What was meant by this slogan of Della Voss will be made clear as we proceed with our examination of reports.

¹⁰ Meriam, J. L., *Child Life and the Curriculum*, New York, 1920, p. 371.

original nature of man, has accordingly returned to the early doctrine of the Boston Whittling School.

A second contributing factor to Woodward's store of information about manual education was the descriptions of educational exhibits, particularly of those displayed at the Philadelphia Centennial. For this exposition was, above everything else, educational—the occasion for turning the attention of those who were most expert and best informed on the educational needs of our own country toward European methods of education. Of the things which arrested the thoughtful attention of educators, nothing to them seemed more significant than the displays of schools offering trade training as a part of the regular curriculum. The findings of the several committees appointed by the State boards of education in Massachusetts, Rhode Island, and Pennsylvania, and of the State superintendent of schools of the last-named State, warrant attention and close study at the hands of anyone interested in the history of technical education. One report, that of State Superintendent of Schools J. P. Wickersham, as recorded in the annals of the State Board of Pennsylvania for the year 1876, is of special significance. After a lengthy recital of the facilities afforded in the "Improvement Schools," "Real Schools," "Trades Schools," and the special schools of many kinds which were scattered over Germany and Austria, Superintendent Wickersham deals on the basis of first-hand information with "an institution that was handsomely represented" at the exposition:

In the Artisan's School of Rotterdam are taught for a part of the day the branches in which instruction is usually given in our common schools, together with algebra, geometry, elementary mechanics and physics, drawing, singing, etc. The workshops in which the remaining part of the day is spent are arranged for different trades and are large and comfortable. That these boys attain a good degree of skill in their work was plainly proven by the collection of articles made by them and exhibited at Philadelphia. Those who examined them closely and understood the character of the institution making the exhibit were both surprised and delighted with the result. Their interest was greatly increased when told that the experiment at Rotterdam had shown that boys who are occupied one half of the day with books and the remaining half day with tools in the shops *make about as rapid intellectual progress* as those of equal ability who spend the whole day in study and recitation. And in addition the mechanical skill they acquire is of immense value."

Unfortunately, Superintendent Wickersham did not comment at length on the Russian exhibit. His interest appears to have been in the economic aspects of industrial education and not in the methods of tool training. It is not surprising, therefore, that the novelty of the Russian display escaped his attention.

"Wickersham, J. P., *Ann. State Supt. of Schools, Pa., for the Year Ending June 1, 1876*, pp. XXIX-XXXVI. The italics are author's.

In the eyes of the historian of manual training the most important display at the Centennial Exposition was the exhibit of the Imperial Technical School at Moscow. On this Woodward seems to have had no first-hand knowledge. There may have been an official description, some pamphlet handed out by the attendant, for John D. Runkle, president of the Massachusetts Institute of Technology, quoted at length from the account given by Director Della Voss of the exhibit of the Moscow School.¹³ Furthermore, Woodward stated, in later years, that when he went to the exhibit in Philadelphia in 1876, "there was not a school exhibit from any place in the United States that had any manual training in it."

No mention was made in any of his writings of a visit to the Russian display. There appears to have been good reason for the omission. It is probable that he never actually saw it, since educational interests were notoriously slighted by the management of the Centennial Exposition in the assignments of locations.¹⁴ Hidden under a stairway, the small cabinets of models sent by the Imperial Technical School attracted few sightseers.¹⁵ Woodward came to know the true nature and importance of these models only through the eyes of Runkle and through the report of the Rhode Island committee on education. For that reason discussion of this exhibit is reserved until his study of Runkle's writings shall be taken up.

A third document which came to Woodward's attention was a report on a proposed "developing school" in Boston. He was profoundly influenced by this pamphlet, which foreshadows the modern prevocational school, but he rightly rejected the impractical part of the project outlined in it. A committee appointed by the American Social Science Association, of Boston, presented on January 10, 1877, a tentative plan for the establishment of a "developing school and school shops." Their report urged vocational guidance, prevocational training, and the establishment of State-supported trade schools:

The committee took the ground that all boys after leaving our public and private schools are as much entitled to a free education of the hand as they have been to the education of the head given them at the public school; where they may be taught that trade, art, or calling for which they are best fitted by nature, as ascertained by the developing school.

How [they inquire] shall we train the children and youth who are to succeed us in this world, changed by science and invention, for the wide field of responsibility that lies before them? Apprenticeship having departed, never

¹³ Runkle, John D., *The Russian System of Shopwork Instruction for Engineers and Machinists*. Boston, 1876, pp. 8-18.

¹⁴ Woodward, C. M., address of welcome, *Nat. Educ. Assoc.* 1904: 46 (St. Louis meeting). See report of Walter Smith, contained in fortieth annual Rpt. of Bd. of Ed., Mass., 1875-76, p. 42.

¹⁵ Letter of President John D. Runkle, published in Charles H. Ham's *Manual Training* (Harper & Co.), 1886, pp. 331-32.

to return in its ancient form, something must take its place and give to our artisans practical instruction. It is well known there is no place at present, nor has there been for some time past, where a boy could "learn a trade."¹⁶

In answering their own inquiry, the committee suggested:

First, that the youth whenever he has completed his general education in any public or private school may enter what may be called a developing school, so established and arranged as to give all the pupils a good general idea of all the different trades, arts, or callings, in order that it may be ascertained by themselves or the superintendent for what kind of business they have the greatest natural genius. Secondly, as soon as it should be ascertained what kind of business the pupil is best fitted for by nature he would be recommended to the school shop where that trade could be taught.¹⁷

In the discussion which followed the presentation of the developing school report Wendell Phillips well expressed the situation which came to exist when he said:

The discrimination against those who prefer to work with their hands is very unjust. Our system of education helps the literary class to an unfair extent when compared with what it affords to those who choose some mechanical pursuit. Our system stops too short; and as justice to boys and girls, as well as to society, it should see to it that those whose life is to be one of manual labor should be better trained for it.¹⁸

Though Edward Everett Hale, a member of the committee, called attention to "the difficulty of educating boys in accordance with their native ability even when that has been ascertained," the practical difficulties in the way of furnishing their shop with "every tool and appliance of every name and nature that is used in any shop whatever, etc.," nevertheless did not occur to the members present.

Accompanying the foregoing committee's report were a number of interesting press notices voicing approval of the developing school scheme. A phrase or two from these will show the general interest in manual education and the emergence of the notion of continuity of hand training from the kindergarten through the entire school period:

Mr. Ruggle's plan for manual education.—The public interest in this subject is not an ephemeral thing. There has been a growing feeling in the public mind that some new departure must be taken in our educational system to adapt it to the new wants created by the social and other changes of the past 20 years. The most difficult problem which presents itself in deciding in regard to a boy's future is, "What is he best fitted for?" It could almost be said truthfully that nine-tenths of the failures in life come from neglecting to decide this question intelligently.¹⁹

¹⁶ A committee appointed by the American Social Science Association, Report on a Developing School and School Shops, Boston, Jan. 10, 1877, pp. 2-4. I hope to show elsewhere the prophetic nature of this little pamphlet.

¹⁷ Ibid., pp. 4-5.

¹⁸ Ibid., pp. 9-11.

¹⁹ Quoted from the Boston Post, Feb. 5, 1877; a committee appointed by the Amer. Soc. Sci. Assoc., Report on a Developing School and School Shops, Boston, Jan. 10, 1877, pp. 23-24.

Mechanical schools.—The opinion of Hon. Elizur Wright that our common-school system is set up "wrong end foremost," because children should be taught the use of tools before they learn to read, write, and spell, deserves consideration, as coming from a man who knows experimentally whereof he chooses to affirm and feels a deep personal interest in the right advance of popular education. The kindergarten idea is not so far away from his as to be denied relationship, and may in time operate to bring his into universal recognition.²⁰

More significant than anything else in the antecedents of the St. Louis Manual Training School outside St. Louis was the centennial exhibit of the Imperial Technical Institute of Moscow, which has been mentioned. The reports of the committee on education to the Rhode Island General Assembly and those of John D. Runkle to the corporation of the Massachusetts Institute of Technology and to the Massachusetts State Board of Education were familiar to Woodward. All of these were as pointed out by the Rhode Island report, descriptions of the methods employed in the Russian school, "an entirely 'new departure' in manual education." Its novelty consists in conforming manual education to the system and well-established principles which have proved successful in developing skill in other arts and sciences. By this system they [the Russians] analyze the process requiring manual skill, and teach each process by itself to a class * * * The fact that the instruction is given to so many pupils at a time, in a class, is a marked feature, carrying out, as in so many other respects, the analogy with our general system of mental training.²¹

In the Rhode Island report Woodward found what he had long been seeking, namely, the solution of a difficulty he had encountered in the polytechnic school. The problem of economy in classroom procedure was solved: The instructor performed the day's task in the presence of the class, and the pupils were required to duplicate it.

The attention of the American educational world was called to this method by the exhibit of the Imperial Technical School of Moscow at the Philadelphia Centennial, 1876. President John D. Runkle, of the Massachusetts Institute of Technology, seems to have been one of those who recognized most clearly the possibilities of the work shown. In a paper of extraordinary directness, force, and brevity he outlined the basic principles of the Russian system of manual education for engineers:

As this institute (Massachusetts Institute of Technology) was selected by the State to represent the mechanic arts, for which we receive one-third of the income derived from the national grant (act of Congress, 1862), we have watched the experiments in this department which the various schools have

²⁰ Ibid., pp. 25-26.

²¹ Report of Rhode Island Comm. on Ed., Acts, Resolves, and Reports of the General Assembly, Jan. session, 1877, public document, Appendix No. (12), p. 32.

been making with the deepest interest, believing that the time would come when the best solution would be reached, and trusting that when it was reached we should be in a condition to take advantage of the experience.

* * * We went to Philadelphia, therefore, earnestly seeking for light in this as well as in all other directions, and this special report is now made to call your attention to a fundamental and, as I think, complete solution of this most important problem of practical mechanism for engineers. The question is simply this, Can a system of shopwork instruction be devised of sufficient range and quality which will not consume more time than ought to be spared from the indispensable studies?

This question has been answered triumphantly in the affirmative, and the answer comes from Russia. It gives me the greatest pleasure to call your attention to the exhibit made by the Imperial Technical Schools of St. Petersburg and Moscow, consisting entirely of collections of tools and samples of shopwork by students, illustrating the system which has made these magnificent results possible.

In all constructions a certain limited number of typical forms are found, these forms being more or less modified to adapt them to special constructions. These forms will also fall in groups, each to be worked out in a certain way and with special tools. If then the student can be taught to work out these forms, each in the best way, and with the tools best adapted to the work, he will be far advanced in the skill which will make him available and useful in construction. The ideas involved in the system are, first, to entirely separate the *instruction* shops from the *construction* shops; second, to do each kind of work in its own shop; third, to equip each shop with as many places and sets of tools, and thus accommodate as many pupils as a teacher can instruct at the same time; and, fourth, to graduate the samples to be made in each shop according to some scale, that of difficulty being probably the best in practice.

* * * The aim is to give sufficient skill in each specialty in the shortest possible time and to give the instruction to as many at the same time as the teacher can well instruct, thus securing the greatest economy of time, therefore money, to both teacher and pupil.²²

The parallel to the situation in which present-day educators find themselves in attempting to solve the problem set them by the Smith-Hughes bill is very striking. Both in President Runkle's time and now the problem has been to make education more practical and to "integrate it with industry. To his efforts the very wide interest in the Russian display and the frequent references to the "Russian system" are chiefly due.

Some idea of what was shown in Machinery Hall can be obtained from a condensed catalogue appended to the report last quoted from. The display comprised several sets of wood-turning, joinery, forging, metal-turning, and tool-making exercises, together with enlarged models of the particular tools and cutting instruments employed in their execution. While these parent models are usually associated with the name of Della Voss, it is now impossible to discover what

²² Runkle, John D., *The Russian System of Shopwork Instruction for Engineers and Machinists*, Boston, July 19, 1876, pp. 5-6. Few copies of the report are extant; hence it is quoted at length.

See also "The Russian system of trade education," *Scientific American*, vol. 35, Oct. 21, 1876, pp. 265-66.

share Della Voss had in their creation. However, in a somewhat lengthy and involved comment on the work of the Imperial Technical Institute of Moscow, of which he was director, he emphatically declared:

If we except the attempts made in France in the year 1867 by the celebrated and learned engineer, A. Cler, to form a collection of models for the practical study of the principal methods of forging and welding iron and steel, as well as the chief parts of joiners' work, and this with a purely demonstrative aim—no one, as far as we are aware, has hitherto been actively engaged in the working out of this question in its application to the study of hand labor in workshops. To the Imperial Technical School belongs the initiative in the introduction of a systematical method of teaching the arts of turning, carpentering, fitting, and forging.

The program of work was introduced into the workshops in 1868. In the year 1870, at the exhibition of manufacturers at St. Petersburg, the school exhibited its methods of teaching mechanical arts, and from that time they have been introduced into all the technical schools of Russia.

It is certain that the influence of the Russian school on American education did not extend beyond the giving of the original impulse. There never was any American drawing on Russian education in Russia; moreover, there is no evidence that anything written in Russian or by Russians, except Della Voss's description of the Philadelphia exhibit, was ever consulted by American educators. Yet in the early years of manual training, prior, say, to 1880, the "Russian system" is referred to again and again. A characteristic passage is the following excerpt from the forty-first annual report of the Massachusetts State Board of Education (1876-77):

The manual element in education.—There is a growing feeling that our public education should touch practical life in a larger number of points. * * * If this is to be done through the introduction of a larger manual element, a few questions at once arise.

1. On what ground can we justify the introduction of the manual element into our system of public education?

* Solely on the broad ground of its educational value to all. * * * The advocates for the introduction of drawing (manual training) must then show that the subject is either intrinsically educational or can be made so by the method of teaching it, of which it seems to me there can be no doubt. * * * The manual element, either in the graphic or mechanic arts, must be taught by such methods as will cultivate the other powers through the acquisition of manual skill.

2. Have we found a method of teaching the mechanic arts, both theoretically and practically, similar to those used in teaching the sciences and other purely mental subjects?

The Imperial Technical School of Moscow was the first to show that it is best to teach an art before attempting to apply it; that the mechanic arts can be taught to classes through a graded series of examples by the usual laboratory methods which we employ in teaching the sciences. * * *

* Runkle, John D., *The Russian System of Shopwork Instruction for Engineers and Machinists*. Boston, July 19, 1876, pp. 5-6.

Making the art and not the trade fundamental, and then teaching the art by purely educational methods, is the Russian system. The system is instruction in the arts for the purpose of construction, and not construction for the purpose of instruction. The method is not only educational, but it constitutes the only true and philosophical key to all industrial education.²⁴

Concerning this discussion Doctor Woodward shrewdly remarked:

It is obvious from this report that Dr. Runkle looked deeper into the problem than had Della Voss; he saw that shop instruction, essential to a mechanical engineer, had elements of value in a general education.²⁵

Woodward was thinking here, of course, of Runkle's discovery that the making of a series of carefully graded, abstract exercises lending themselves to demonstration before a class by an expert could be grafted upon the existing system of education without violating the theory of formal discipline.

The Imperial Technical Institute trained only Government engineers. After passing a severe competitive examination the students entered a course of training covering six years—three years while mastering the elements in the school workshops and three while applying them in the production shops attached to the school. The first effort to realize the inspiration awakened by the models of Della Voss was made at the Massachusetts Institute of Technology. In his report to the corporation for the year 1876, Runkle gave an exhaustive review of the Russian system. He recommended that "without delay the course in mechanical engineering at the institute be completed by the addition of a series of instruction shops."²⁶ In accordance with this recommendation shops were established in 1876 and opened the following year. Wrote Runkle, eight years later:

My first work was to build up at the institute a series of mechanic art shops or laboratories to teach these arts, just as we teach chemistry and physics, by the same means. At the same time I believed that this discipline could be made a part of general education, just as we made the sciences available for the same end through laboratory instruction.²⁷

Furthermore, in formulating the new method—

It was appreciated that this class of teaching was not alone valuable as a part of the engineering courses, but that it would be of great service to boys or young men intending to enter mechanical trades. The opportunity was extended to such by the formation of a subsidiary school called the school of mechanic arts, in which were taught, in addition to the shop work, some of the ordinary school subjects.

²⁴ Runkle, John D., Report to Mass. Bd. of Ed., 1876-77, pp. 187-9.

²⁵ Woodward, C. M., The Manual Training School, Boston, 1887, pp. 4-5.

²⁶ Bush, G. G. (editor), Hist. of Higher Educ. in Mass., Bu. of Educ. Circ. Inf. No. 6, 1891, p. 312.

²⁷ Letter of John D. Runkle, published in Charles H. Ham's Manual Training (Harper & Co.), 1886, pp. 331-32.

G. G. Bush, the authority last quoted from, continued:

A manual training school, the first of its type, was thus established. It served a double purpose—first, as a school; second, as a model and stimulus for education of this sort in the community.”²²

“A manual training school, the first of its type,” is not exactly correct, for this institution was not in any respect a preparatory school for the institute. The school at the Massachusetts Institute, truly enough, was the first of its type; that is to say, the first school to employ the Russian system.”²³ It had a two-year course open to boys 15 years of age who had completed the grammar school. This school was known at the time of its establishment and throughout its history as the School of Mechanic Arts. It was entirely different in curriculum, in aim, and in spirit from the St. Louis Manual Training School and from all succeeding manual training high schools.

The reading of Woodward shaped his theory as well as his practice. From the Massachusetts report he drew his defense of manual training as a suitable branch of education, a defense which he based on the doctrine of the transfer of training: “The manual element, whether in the graphic or mechanic arts, must be taught by such methods as will cultivate the other powers by the acquisition of manual skill.” From the Boston Whittling School report came knowledge of the experience with the Russian system of manual training in class work with boys of less than college age. From the report of State Superintendent Wickersham he derived the justification for insertion of manual training in an already crowded curriculum:

Boys who are occupied one half the day with books and the remaining half day with tools in the shops make about as rapid intellectual progress as those of equal ability who spend the whole day in study and recitation.

From this last report also he drew suggestions for the content of the nonmechanical features of his school, particularly singing. In the report on developing schools he found what became one of the abiding aims of St. Louis Manual Training School—“the development of natural aptitudes.” There, too, he came upon the idea of the continuity of manual education from the kindergarten through the polytechnic school. The Rhode Island report gave an elaboration of the content of the “new departure” and made clear the bearing of the Russian system on economy of classroom procedure. Furthermore, the collection of implements and pieces of machinery contributed by the Russian Government to illustrate the work done at the Imperial Institute were, we know, visited by Mr. Charles F.

²² Bush, G. G. (*Editor*). *Hist. of Higher Educ. in Mass.*, Bu. of Educ. Circ. Inf. No. 6, 1891, p. 313.

²³ On the “School of mechanic arts,” see “Elementary instruction in the mechanic arts,” *Scribner's Monthly*, XXI (1880), 902-0.

White, one of the instructors in the Philibert Mansion shops and the first shop superintendent at the St. Louis Manual Training School.

The notion of manual education as a part of the curriculum of the secondary school, as it shaped itself in Woodward's mind, was a combination of many hints and experiments. But this fact should not lessen the credit due to him. It is only because he acknowledged his obligations so scrupulously that his sources can now be traced. All this material had been available for years, and yet Woodward alone was able to put the suggestions together and create the manual training high school.

The origin of the name "manual training school" is exceptionally interesting, not only as cogently illustrating the fact that educational terminology comes out of the past trailing clouds of vagueness, but also because the character of Woodward is strikingly exemplified by his remarks on the term finally chosen. A certain odium had become attached to the terms "development school" and "manual labor school" by their association with a type of tool instruction advocated throughout the Eastern States for indigent students. Hence it was desirable that the name should not only be symbolic of the unique features of the course but also should not create a prejudice against the school at the very outset. Some time early in 1879 three persons met with Woodward in his office in the old university building: William G. Eliot, chancellor of Washington University; Charles A. Smith, professor of civil and mechanical engineering; and Charles F. White, superintendent of school shops. The object of the meeting was to decide upon a name for the new school soon to be established. Quite a list of names was proposed; Woodward favored a phrase which he had inadvertently used in 1877 to designate schools which differ radically from the ordinary system of apprenticeship, namely, "manual training schools." To the suggestion that few would understand what sort of school it was, he answered: "That is what is desired. People will not have preconceived ideas and will inquire of us what it signifies, and we shall have the opportunity to give correct information."²⁰ To this name Woodward clung with the affection of an inventor. Many years later he declared:

The name "manual training school," suggested by me in 1879, still appears to be the best. It has been received with great favor both in the United States and in England. To be sure the etymologists are trying to make manual training cover everything in which the hand is used instead of allowing it the restricted meaning first given it. The manual training school teaches no trade, prepares for no calling or profession. It gives as wide a training in the practical arts as it does in literary and commercial fields. If people will

²⁰ Letter of Charles F. White to C. P. Coates, Nov. 7, 1921.

take the trouble to seek for the meaning of the name, not in the dictionary but in the organization of the school itself, its significance will be easily seen."

What is implied by the rejoinder of Woodward to the effect that information about manual training must be sought from the authorities of the manual training school? Or, differently stated, what "meaning of the name manual training" could one have found "in the organization of the school itself?" A simple question this, but recall that not only did Woodward coin the name "manual training school," but through the influence of his school, during the formative days of manual training, he gave it a specific meaning which became attached to it throughout the country. "The wipped word, 'Put the whole boy to school,' found an echo everywhere. Our leading educators recognized the general educative value of the new branch of study."²² Let us try to answer the query by recourse to the written and cumulative records of those best qualified to speak—"the prophet and missionary of this remarkable contribution to education," Calvin M. Woodward, and his principals. As interpretation is the life of a chronicle, a word of comment now and then will be inserted.

Two groups expressed doubt about the advisability of the new departure: Those concerned with education and its administration believed that the manual arts did not lend themselves to the purpose of schools as they conceived them, and, secondly, those engaged in practical pursuits questioned the possibility of developing men skilled in the handicrafts by school instruction. Chancellor Eliot in a memorable passage tells how—

When first deliberately announced that a manual training school would be organized and put into operation as a department of a university some of the older friends of education almost ridiculed the idea. A carpenter shop and blacksmith's forge seemed to them a singular appendage to the college humanities and the schools of philosophy and advanced learning which dignify the university career.²³

Prominent educators thought that:

The introduction of tools, materials, machinery, and the theory of construction and technical drafting might not only break up the orderly program of a school but lower the intellectual and moral tone as well.²⁴

Many anxious minds shared the feeling "that whatever energy was absorbed in manual training was just so much energy withdrawn from mental culture. One distinguished opponent of the movement

²² Catalogue, St. Louis Man. Tr. Sch., 1888-89, p. 51.

²³ Rathmann, C. G., The Mission of Manual Training, an address before the graduating class of the Manual Training School of Wash. Univ., June 23, 1909 (published by managing board), p. 7.

²⁴ Elliot, Wm. G., Report to Board of Directors of Wash. Univ., May 5, 1893, p. 5.

²⁵ Woodward, C. M., The Science of Education: Proc. Amer. Assoc. for Advancement of Science, 57: 353, Dec., 1906.

declared that "the advocates of manual training are placing kegs of gunpowder under every school in America."³⁵

Not only the college professor and the educator but the practical men of the Nation were suspicious of the new doctrine. Many conservatives yet living can remember how "they called Woodward a man of one idea and scoffed at him." It was hard to convince these practical men "that the theory and use of tools can be taught otherwise than by the good old method of going into the shop and putting in 10 hours a day."³⁶ Fred Taylor, the father of scientific management, expressed similar views in a discussion which followed the reading of one of Woodward's papers. Taylor doubted particularly whether the school could train managers as it wished to do. The ability to manage and the understanding of men, he maintained, could not be inculcated in the schoolroom. In saying this he voiced the opinion generally held by the active members of the American Association of Mechanical Engineers.³⁷

In reply to these criticisms the advocates of manual training urged that:

The word "university" was itself borrowed from the guilds or trade associations which were known as universities two or three hundred years ago, as the university of bakers, of smiths, of watchmakers, etc., in Rome and in London.

They declared further that in training the hand the mind was in no sense to be neglected; that the manual training school "merely extended the humanities so as to include human needs as they exist now and here;" that the aim of the school was not to produce mechanics but to afford continuous mental discipline.³⁸

It will be remembered that, at the time of the introduction of manual training, formal discipline was a sufficient justification for the presence of any subject in the curriculum. With this background the significance of the following passages will be appreciated. President John D. Runkle, to whom Woodward constantly referred in the formative days of the school, expressed himself as early as 1877 in no uncertain terms: "I don't care if the student never touches a tool after he leaves school. The course is justifiable, simply on the ground of the discipline it gives."³⁹ The effect of such a remark on Woodward, who termed Runkle the man "to whom more than any other the cause of manual training in America is indebted," is apparent:

The simultaneous development and discipline of the intellectual and physical faculties is the main object of the course. The idea of a school is that

³⁵ Woodward, C. M., in Rep. of U. S. Commr. of Ed., 1893-94, Vol. I, p. 891.

³⁶ Ibid., catalogue St. Louis Manual Training School, 1902-3, p. 4.

³⁷ Discussion: Woodward, C. M., The Training of a Dynamic Engineer in Washington University. Proc. Amer. Soc. Mech. Engineers, 7: 771-83. (Chicago, 1886).

³⁸ Rep. president to board of directors of Wash. Univ., May 5, 1883, pp. 5-6.

³⁹ Report on a developing school and school shops, by a commission appointed by the Amer. Sc. Sc. Assoc., Boston, 1877, p. 18.

pupils are to be graded and taught in classes; the result aimed at being, not at all the objective product or finished work, but the intellectual and physical growth which comes from the exercises. Of what use is the elaborate solution in algebra, the minute drawing, or the faithful translation, after it is well done? Do we not erase the one and burn the other, with the clear conviction that the only thing of value was the discipline, and that it was indestructible?"

Now we proceed in manual education on precisely the same plan. All the manual work is disciplinary. Manual dexterity is but the evidence of a certain kind of mental power. Hence the primary object is the *acquisition of skill* in the use of tools and material and not the production of specific articles. The true method of instruction is to teach the elements first. We abstract all the mechanical processes and manual arts and typical tools of the trades and occupations of men, arrange them in a systematic course of instruction in the same, and then incorporate it into our system of instruction. Thus without teaching any one trade we teach the essential mechanical principles of all."

Now, the danger to which anyone is exposed in such reasoning as Woodward used is that of pushing the analogy too far. *More mental discipline*, he was beguiled before long into believing, "can be given by combining manual training with the study of mathematics, science, and literature than by omitting manual training and giving the attention exclusively to other subjects."² It is difficult to understand by what process of ratiocination the "faculty training" developed by this peculiar combination of manual and mental training was believed to be especially advantageous to the pupil. Recourse to an earlier paragraph in one of the school's catalogues may clarify matters. Here it was declared that "success in drawing or shopwork has often had the effect of arousing the ambition in mathematics and history, and vice versa." The writer resumed: "Gradually the students acquire two most valuable habits which are certain to influence their whole lives, namely, precision and method."³

That last paragraph is an imperishable and indestructible contribution of Woodward to the literature on the transfer of training. Anyone who takes from or adds to that is a bungler. This remark is probably the first appearance of the doctrine of formal discipline as it is now most successfully defended.⁴ It is generally granted that there is a transfer of "method," and possibly of "precision," and it is notable that these two and only these two qualities were

² Prospectus, St. Louis Man. Tr. Sch., St. Louis, 1879, p. 18.

³ Catalogue, St. Louis Man. Tr. Sch., 1883-84, pp. 27-28. In 1894 Woodward wrote: "Almost the only thing that a student should be able to show at the end of his training is the discipline, the knowledge, and the clear insight he has gained." Cf. Woodward, C. M., Review of Louisville address, *Gassiers*, 5: 478, Apr., 1894.

⁴ Woodward, C. M., *The Intellectual Value of Manual Training, a Reply*. The Teacher, Feb. and Mar. (New York), 1889, reprint, p. 10.

⁵ Catalogue, St. Louis Man. Tr. Sch., 1884-85, p. 23.

⁶ I am much aware that there exists an influential group of psychologists who prefer to consider the matter from the standpoint of identical, rather than transferable, elements.

selected by Woodward. In this formulation he was more than a generation ahead of his time. Unfortunately, he never makes this point again. Overwhelmed with the notion of the transfer of the training, he failed to see that only these two qualities can possibly be thought of as transferable.

With this explanation in mind the problem involved in Woodward's emphasis on the value of manual training conjoined with the traditional subjects suggests its own solution. In combination with the ordinary curriculum, manual training gave more of precision and more of method than any other educational recipe. On this was based its *raison d'être*. That the combination was the magical transforming medium is clear, for the school authorities maintained that—

to find the educative value of a feature of school training (manual training) it must be considered as it is given in connection with other school work. It is utterly unreasonable to take it out of its environment.⁴⁵

The same notion appeared elsewhere, as follows: "All our classifications are made on the basis of academic studies."⁴⁶ Or again, "In our school the manual elements are subordinated to the intellectual."⁴⁷ This position, the insistence on the almost magical potency of the union of manual training and the old curriculum, was held officially by the school until its dying day.⁴⁸

In harmony with the foregoing doctrine it was held that "instruction and not construction" was the true method of tool instruction. The superiority of acquiring accurate manipulation and tool control by means of abstracted exercises and "synthetic" projects, in contrast to the incidental method familiar in the factory, was repeatedly proclaimed in the school's records and literature. It was further illustrated by an episode in a meeting of the board of managers. Considerable discussion took place in regard to the purchase of a grinding machine. It was agreed that there should be—

no lack of the usual effort at acquiring skill in the ordinary uses of the lathe, and that the grinding machine should only be employed for saving useless repetitions and for attaining a high degree of accuracy.⁴⁹

Genuinely cultural work, it was felt, could not be carried on on a commercial or production basis.⁵⁰

In a manual training school everything is for the boy; he is the most important thing in the shop, the only thing to be put on the market. As a rule

⁴⁵ Woodward, C. M., *The Educational Value of Manual Training* (D. C. Heath & Co., New York, 1890, p. 12.

⁴⁶ Calendar, St. Louis Man. Tr. Sch., 1901.

⁴⁷ Clarke, I. E., Editor, *Art and Indus. Educ. in United States*. Washington, 1898, Vol. II, p. 776.

⁴⁸ Catalogue, St. Louis Man. Tr. Sch., 1914-15, p. 2.

⁴⁹ Minutes, Managing Bd., St. Louis Man. Tr. Sch., Oct. 28, 1903, p. 238.

the products of the shop have little or no commercial value. They always illustrate forms of useful construction; and they give opportunity for enforcing correct methods of procedure.⁵⁰

Following out the analogy with which he began, Woodward came to the conclusion that—

were all the exercises of the year shoveled into the furnace and burned, so far as they are combustible, all the manual training would survive in the developed brains and trained functions of the pupils.⁵¹

The original theory of manual training was faithfully lived up to.⁵² Though the term "discipline" was discarded in the statement of theory published in the catalogue of 1912-13,⁵³ nevertheless manual training was still spoken of as contributing to the "development of brains and trained functions"—a formulation in which the very essence of the words of Runkle written in 1877 was still preserved.⁵⁴ Runkle's fame, however, did not arise from the work of his school, nor from his participation in the great manual training school movement which followed in the wake of the educational conventions of the early eighties. It rested solely upon his expansion of the accepted educational fiction of the nineteenth century. In his hands manual training was made to conform to the doctrine of formal discipline. With the eclipse of this theory, manual training as conceived by Runkle and as realized by Woodward passed into oblivion.

Precisely what Woodward had in mind when he so enthusiastically declared that "the manual training which begins in the kindergarten should never cease," we shall never know. Realizing better than did his contemporaries the almost insuperable obstacles in the way of cataloging the handicraft interests of the younger children into a set course of formal discipline instruction, he refused to theorize in the realm of elementary manual training.⁵⁵ When he was referred to as an advocate of the introduction of shopwork into all the grades, he indignantly denied that he advocated any such thing.⁵⁶ At the time manual training was introduced in the St. Louis public schools, he said:

We have just opened two manual training rooms for boys and girls of the seventh and eighth grades. * * * I do not look for great industrial results from this lower grade work directly. It will certainly serve to keep the boys

⁵⁰ Catalogue, St. Louis Man. Tr. Sch., 1884-85, pp. 28-30.

⁵¹ Ibid., 1905-6, p. 54.

⁵² Catalogue, St. Louis Man. Tr. Sch., 1906-7, p. 8.

⁵³ Ibid., 1912-13, p. 12.

⁵⁴ Committee app't. by the Amer. Soc. Sci. Assn., report on a developing school and school shops, 1877, p. 18.

⁵⁵ Woodward, C. M., *The Manual Training School* (Boston), 1887, Preface.

⁵⁶ Woodward, C. M., *The Intellectual Value of Manual Training*. *The Teacher*, Feb. and Mar., 1889, pp. 3-5; see also Rathman, C. G., *The Mission of Manual Training*, St. Louis, 1909, p. 11, note.

longer in school, but the boys are too young to deal with technical matters profitably. It is a great fallacy to suppose that a child in the primary school is capable of receiving a manual training which is of any appreciable technical value; that because you give a little boy tools and materials and give him a single lesson a week in the manipulation of tools and in the use of a detail drawing, he is getting manual training in any adequate sense. * * * Of course, little boys and girls can get excellent mental, moral, and physical discipline and considerable pleasure from the use of edge tools, but we must not expect them to see the logic of their exercises or the rationale of their tools and methods. * * * You might as well expect a boy of 12 to have a full beard as a boy of 11 to have had any manual training worthy of the name."

Woodward's theory might be elaborated further in a number of other examples. We shall confine ourselves to two:

A manual training school is not merely a shop or series of shops and a drawing room, where the boys select the kind of work they fancy and proceed to design what they like. Moreover, its course of study and daily program must yield nothing to childish whims and fancies. Nothing is more untrustworthy than the whims and fancies of a 14-year-old boy. He may know what he likes and what he dislikes, but he has no just knowledge of why he likes or dislikes, nor are his tastes the result of innate capacities so much as they are the fruit of environment."

Just how childish whims were to be suppressed and how good technique was to be obtained are explained with the same directness in the following "illustration":

Directions are given a class in carpentry to saw a piece of wood, holding it upon the bench-dog. A pupil is found attempting to do the work holding it on the trestle. He insists that he can not do it so well in that way. The teacher replies or should reply, "Then that is the way you should do it until you can do it well."

The method more than the end is the object of interest. Obviously Woodward believed that there was something worth while in the performance of a task simply because it was hard.

The educational war which was waged in and around the National Educational Association conventions, during the late eighties and early nineties, forms an interesting chapter in the history of American education. Echoes of the pedagogical volleys which were fired in the counsel's chambers were registered in the school's literature:

Some of our critics are fond of assuming that because we see value in shop-work we must underrate ordinary academic work. The assumption is false. We have distinctly stated that our pupils do not become skilled mechanics, nor do we teach them the full details of a single trade. The tools whose theory, care, and use we teach are representative; and the processes which we teach,

"Woodward, C. M., "What shall we do with our boys," an address delivered before the October meeting of the St. Louis Railway Club, 1898. Reprint, pp. 11-12.

"Bulletin I, The Manual Training School of the Washington University, Aug., 1890, pp. 1-15: "We attach no value to the whims and fancies of a 14-year-old boy, and very little to the ambitious hopes of parents." Cf. Woodward, C. M., The Opportunity and Function of the Secondary School, Nat. Educ. Assoc., 1903, p. 64.

Catalogue, St. Louis Man. Tr. Sch., 1881-82, p. 27.

just far enough to make each step clear and experimentally understood, equally underlie a score of trades. I say experimentally understood, by which I mean that it is not enough to know that a certain outline is to be reproduced or a certain adaptation is to be secured, but one must know just the forces to be directed, the motions needed, and in their order, and all as the result of the closest attention and steady intellectual activity. What then is this so-called manual training but *continuous mental discipline*?"

Our exhibits are chiefly of shopwork and drawing, but the hard work of the school and the most stress in teaching are on ground familiar to every high-school teacher. We deliberately abridge somewhat the literary work, limiting the student to one literary recitation per day as a rule, in the firm belief that the result is a gain in intellectual vigor and practical power. We advisedly choose less psychology, ancient geography, astronomy, Latin, and Greek, and more tool work and drawing, but what bookwork we do have we strive to do well."

At the Louisiana Purchase Exposition, held in St. Louis in 1904, the St. Louis Manual Training School was the only exhibitor of Russian system of manual training. Doubtless the vast number of nonconformist exhibitors elicited an article which appeared in the Twenty-fifth Centennial Prospectus of the school. It was entitled "Substitutes for manual training." At all events, the mixed feelings with which the school's principal viewed the trend of manual arts throughout the country was forcibly expressed. Here the school recognized the competition of certain variant forms of training in handwork and condemned them as *substitutes*. The condemnation was sweeping, but it did not specify the grounds for the rejection of the different kinds of hand training, sloyd, and the like.

Substitutes for manual training.—The success of manual training has called into existence many forms of training which resemble the original but little in form or spirit. In fact so various are the present forms bearing the name that we wish the original use of the words had been copyrighted. Manual training is not manual labor, nor is it extended and systemized kindergarten work. It is not "busy work" to employ the minds and hands of those who excel their classmates in quickness of mental apprehension and manual execution. It is not an occupation in which time and money and energy are lavished in order to make a few show pieces as mementos of a sometime skill. It is not the training of a trades' school. It is not sloyd or work where the utility of the accomplished exercises is of more importance than the making of it. It is not practice with any tool until a commercial proficiency has been attained. It is not an excuse for the application of the fine arts. It is not the optional work done in a shop attached to a high school. It is certainly not the work of a reformatory or of a school for unfortunates. Each of these forms has its merits, but we question its right to assume the name it does."

So far as we can ascertain this was the first statement of this character in which the claims of sloyd and the project method of manual arts instruction had been questioned by the school. What

"Ibid., 1886-87, pp. 37-38.

"Catalogue, St. Louis Man. Tr. Sch., 1890-01, p. 50.

"Twenty-fifth Centennial Prospectus, St. Louis Man. Tr. Sch., 1904, pp. 17-19.

a strange spectacle the article presents when viewed in connection with my exposition of Woodward's theory! We must digest this centennial pronouncement piecemeal, or its lofty phrasing will overwhelm us. It will be noted at the outset that the entire paragraph is couched in terms of negation. Even the wish that the original words had been copyrighted is negative; for in essence copyright is the spirit that denies. Our prospectus writer seemingly regretted that manual training had become a generic term, belittled all elementary manual training interests and insinuated that the objective of the project method of teaching was the production of "mementos of a sometime skill."

It was a hazardous thing for a formal disciplinarian to concede that each of the forms of training mentioned had its merits and in the same breath to assert that sloyd, painstaking Swedish sloyd, was not manual training. In deciding that question, anything other than "continuous mental discipline" quantitatively measured was irrelevant.

Notwithstanding this slip, the writer broke away from mere negation to reiterate as a basis for the school's claims to patronage the abstractions and theories upon which it was first founded. It was this restatement of theory accompanied by a definite refusal to consider the merits of other forms of training that suggested the imperative necessity of going back to the beginning of the school and tracing step by step the evolution of its basic theory. This process has been laborious, but it has been illuminating.

Other characteristic passages in the centennial number are within easy reach and entice us to continue. The experience of 25 years at Manual was summed up in this conservative fashion:

We believe that the theory and practice are sound and up to the times; for the product of the school has been eminently satisfactory, and to-day it is the arguments of the professor [sic], and his personal presentation of the matter, that win the adoption of manual training in community after community."

The writer made two quite distinct assertions: First, that the quality of the graduates establishes the high rank of the school and thereby the validity of the theory; and, second, that the introduction of manual training into modern American public schools was due chiefly to the arguments of Woodward. But these assertions demand a closer examination. There can be no doubt that the success of Manual's graduates has been remarkable, but they represented a picked group of young men. Very early in the history of the school, Woodward outlined the type of student wanted by it:

We have found it necessary, again and again, to send away boys who lacked either the disposition or the ability to appreciate our aims and to adopt our

methods. We must insist upon having only boys who are willing to study and willing to work. All others are but clogs to our machinery."

And again:

The manual training school is not an asylum for dull and lazy boys. Bright and industrious boys are wanted, and no others can expect to hold places in the school."

Many years later:

The boy who wishes to get rid of book study and to spend most of his time in the shops must go elsewhere; so must the boy who is not willing to study five evenings per week at home."

In an earlier chapter it was suggested that manual training was introduced because of a pedagogical belief in its educational value. But manual training as Woodward conceived it was, as a rule, dropped or modified very shortly wherever introduced. That the Russian system of manual training was short-lived, at least in the territory contiguous to the school, is made obvious by a brief extract from the 1902 report of Supt. F. Louis Soldan. It is a mere coincidence, of course, that at the time of Soldan's article Woodward was president of the board of education:

The following plan has been adopted for the manual training instruction of the future and differs somewhat from the plan pursued when the subject was first introduced. It has been found that the technical lessons in the use of tools in the representation of form through drawing are studied with greater interest by the boys *if they are given in connection with the objects which they like to produce.* * * * An option, therefore, is given to the student as to the special object which he wishes to design and make."

That the position of Soldan was also noteworthy as demarking a transitional period in the realm of education can be inferred from such sentences as these:

There is the will power displayed in overcoming the stubborn resistance of the material and giving it the form the mind has planned. * * * It trains creative activity and aims at the acquisition of information by laying stress on doing."

Apparently the one phrase is part and parcel of the older psychology. The other phrase is prophetic of the grounds upon which present-day advocates of manual training base their claims, i. e., the wealth of problematic situation material the study offers for the educand.

Let us return from this digression and take up the line of thought suggested by our query as to what was implied in the Woodward rejoinder early in our narrative. We are now prepared to answer, for

* Catalogue, St. Louis Man. Tr. Sch., 1894-95, p. 47.

* Ibid., 1897-98, p. 34.

* Calendar, St. Louis Man. Tr. Sch., 1901.

* An. Rep. Bd. of Educ., City of St. Louis, year ending June 30, 1902, pp. 156-57.

* Ibid., pp. 158-59.

we have listened with patience to the oracles and to at least one contemporary voice. If the opportunity to do creative work (which is synonymous with joy in work), to externalize ideas, and to appease the elemental desire to vary from routine were tenable in Woodward's scheme of "continuous mental discipline," we have not heard it expressed. Substitution, the remedy for the fallacy of definition, renders unnecessary consideration of such colorless platitudes and abstractions as, "the object of manual training is mastery," and "probably the best economic fruit of manual training is the power of mechanical analysis." We are convinced from the emphasis on faculty training which we have encountered, and which persistently crops out even in this brief review of Woodward's educational creed, that for him a manual training school could never be anything other than a school where sequential Della Voss exercises exclusively were made in the laboratories. For did they not readily lend themselves to mass tactics, to the development of skill in the reproduction of ideas, and to the fiction of formal discipline elevated to the nth power? Were not these exercises "almost as abstract as is long division?"

The writer will never forget the sad look which spread over Woodward's face and the words he uttered when, in 1903, a prospective teacher of grade manual training presented for his inspection and approval a series of useful models. These had been prepared as part of a teacher's course surreptitiously conducted at the Manual by a progressive and enthusiastic teacher. Of the many painstakingly designed and executed models, which the would-be teacher carried in his chip baskets, but one comprised in its construction a difficult joint. This one alone would Woodward even deign to lift from its temporary resting place on his desk. Words fail when an attempt is made to give here the inflection he placed on the phrase, "Has manual training come to this?"

Perhaps the chip-basket episode may be directly connected with a rather pointed paragraph which appeared in a lecture delivered by Woodward in July of the same year:

The great mass of teachers have as yet no adequate conception of the fine invigorating effect of a correct system of manual training upon the mind and character of a healthy, normal boy. I do not refer to manual training ~~itself~~ so called; to the wishy-washy tinkering with tools and materials, where the child is the victim of his own whims and of the teacher's ignorance; where, under the pretense of developing originality, initiative, altruism, or concrete expression, the child is prematurely misled, misdirected, and mistreated, until the possibility of well-timed and well-regulated manual training is utterly lost. I regret that I must speak so strongly of a tendency utterly to emasculate manual training by a method of treatment which would be

* Woodward, C. M., Review of Louisville address: *Cassier's* 5: 478, Apr., 1894.

instantly condemned if applied to any other branch of study. We must, I suppose, excuse a great deal of sentimentalism and extravagance on the ground that the most recent converts are apt to be unbalanced by excess of zeal.¹⁰

Theory, then, as Woodward presented it, did not change with the varying winds of educational doctrine. However much he may have talked of manual training in general, it is apparent that he was indomitable in his efforts to perpetuate the existence of schools patterned after the particular one over which he presided. Yet the St. Louis Manual Training School itself was more or less sensitive to the demands of public opinion. Indeed, very few subjects connected with its early and subsequent history are more interesting than that of its declared aims as they were set forth from time to time. With the manual arts curriculum of the secondary school in a state of ceaseless flux and with vocational guidance an unsolved problem of the day, Woodward's poignant comments upon the aims of a manual training school are worth collecting. The multiplicity of purposes which found expression in the school's literature makes classification, however, a puzzling task. It must suffice for this review to group the formally published aims of the school as social, prevocational, vocational, and cultural; of which the first, the social, never except in the very first years appear to have had much importance in the minds of the administrators, and the last, the cultural, acquiring a leading position only in the closing years.

From catalogues, bulletins, reports, lectures, and articles there has been gathered whatever throws light on the purposes and goal of the school. Further, the time at which new aims came above the horizon has been indicated. Under this heading are included all formal pronouncements of the school's aims and purposes, with the particular endeavor to show the persistent appearance or disappearance of the individual planks in its platform. By thus surveying the formal program of the school it will be shown, it is hoped, how Woodward conducted and advertised his manual training school. For the most part this matter is given in his very words, and inasmuch as it is usually readily intelligible, running comment has been refrained from.

I. SOCIAL.

To dignify labor.—One great object of the school is to foster a higher appreciation of the value and dignity of intelligent labor, and the worth and respectability of laboring men. A boy who sees nothing in manual labor but mere brute force despises both the labor and the laborer. With the acquisition of skill in himself come the ability and the willingness to recognize skill in his fellows.¹¹

¹⁰ Woodward, C. M., *The Opportunity and Function of the Secondary School*. Nat. Educ. Assoc. Proc., 1903, p. 65.

¹¹ First found in catalogue, 1880-81, pp. 20-21. The same idea persists throughout the catalogues.

II. PREVOCATIONAL.

*To serve as a developing school.*¹—It is confidently believed that the developments of this school will prevent those serious errors in the choice of a vocation which often prove so fatal to the fondest hopes. It often happens that students who have special aptitudes in certain directions find great difficulties in mastering subjects in other directions. In such cases it is often best to yield to natural tastes and to assist the student in finding his proper sphere of work and study. A decided aptitude for handicraft is not unfrequently coupled with a strong aversion to and unfitness for abstract and theoretical investigations.²

Choice of occupations is one of greatest importance, for out of it are the issues of life. An error here is often fatal. But to choose without knowledge is to draw as in a lottery, and when boys know neither themselves nor the world in which they are to live, it is an even chance that the square plug gets into the round hole.³ But aptitudes do not lie on the surface, nor is a boy's early fancy a safe guide. Childish whims are often mistaken for natural gifts. The developments of the early years are more a matter of accident than they are of natural aptitude.⁴ Not till a boy is well on in his teens and has been broadly trained can one discover his aptitudes. Every boy is by natural right entitled to such preliminary training. Hence the manual training school proceeds upon the supposition that first of all the untrained boy is to become a trained man. No assumption as to his occupation in life is made. He may be "called" to be a farmer or a mechanic; an artist or an artisan; a lawyer or an engineer; a farmer or a merchant.⁵

III. VOCATIONAL.

1. *To serve as a "trades' elements" school.*—I am in favor of having nearly every young man learn a trade, or, rather the essential elements of many trades; but I would not have him learn a single specialty so early and so exclusively as to learn nothing else.⁶ Only about 50 out of 100 are so constructed mentally and physically that they can and ought to learn what are known as the industrial trades. I have no great faith in the value of attempts to teach employments, commercial or industrial, within the limits of any secondary school. Any trade or special employment must be dwarfed and narrowed before

¹ First found in catalogue, 1880-81, pp. 20-21. Cf. Committee appointed by the Am. Soc. Sc. Assn., rep. on a Developing School and School Shops, Jan. 10, 1877. The "developing school" here first mentioned is practically what is meant by "prevocational training." In many contemporary trade schools a one-year course of this sort is given, i. e., a year in which the student is allowed to try his hand at everything in order to discover his "natural aptitudes."

² First found in Prospectus of the Manual Training School of Washington University, Nov., 1879, p. 10. There is a curious change in this passage after it had stood several years in the catalogue. The allusion to "abstract and theoretical investigations," of which obviously the technically trained man should be capable, was removed; and for it was substituted the harmless phrase: "Or to literary work which largely taxes the memory." See catalogues, 1889-90, p. 47.

³ Education, IV, 1883-84, p. 237.

⁴ Art and Industry, 1892, Vol. II, p. 779.

⁵ Bulletin No. 1, The Manual Training School of Washington University, Aug., 1896, p. 15; see also Woodward, C. M., "What should be added to the essential branches?" Nat. Educ. Assoc. 93; 266-68: Here he declares, "The idea of predestination to a particular calling is obnoxious."

⁶ Woodward, C. M., "What shall we do with our boys?" Address delivered before the October meeting of the St. Louis Railway Club, 1898, p. 3.

It can be brought down to the grasp of an untrained boy, and its very narrowness unfits it for the best educational uses."⁷⁸

2. To lay a broad and appropriate foundation for a higher technical education."⁷⁹

3. To lay a broad and appropriate foundation for a higher education which is not exclusively classical."⁸⁰

4. To lay a broad and appropriate foundation for a higher education."⁸¹

It is not assumed that every boy who enters this school is to be a mechanic. Some will find that they have no taste for the manual arts, and will turn into other paths—commerce, law, medicine, or literature. Some who develop both natural skill and strong intellectual powers will push on through the engineering school in the realms of professional life as engineers, architects, and scientists."⁸²

Now, as to grade. The Manual Training School is not a kindergarten, nor primary school, nor a grammar school. It regards all such as preparatory to its curriculum. On the other hand, it is not an engineering school. A good manual training school is strictly preparatory to a good school or college of engineering."⁸³

The Manual Training school has become (1896) a school preparatory to higher education far more than was originally intended. In increasing number the graduates of the school enter Washington University, Cornell University, Massachusetts Institute of Technology, the University of Missouri, and Harvard University."⁸⁴

IV. CULTURAL.

1. To put the whole boy to school."⁸⁵—My whole theory of education can be expressed in six monosyllables: "Put the whole boy to school." I can ask no more. The boy is a very complicated machine. He needs to be trained on all sides, and all I ask is that he shall have the light shine in on all sides of him."⁸⁶

2. To develop the whole boy by exercising every part of his brain."⁸⁷

A characteristic formulation of aims and advantages which may serve as a conclusion to these extracts appeared in the catalogues for 1910-11.⁸⁸ Since this is such an interesting document it is printed verbatim.

⁷⁸ Woodward, C. M., Discussion. Amer. Soc. for Advancing Sci., 56: 371-73. Woodward makes, it will be noticed, no effort to reconcile this opinion with the preceding one.

⁷⁹ First found in catalogue, St. Louis Man. Tr. Sch., 1894-95, p. 6; continues to 1908-9.

⁸⁰ Found in catalogue, St. Louis Man. Tr. Sch., 1908-9, p. 10.

⁸¹ First found in catalogue, St. Louis Man. Tr. Sch., 1909-10, p. 15; continues to 1913-14.

⁸² Circ., St. Louis Man. Tr. Sch., Aug., 1886. Filed with minutes, Managing Bd., St. Louis Man. Tr. Sch., p. 103.

⁸³ Bul. No. 1. Manual Training School of Wash. Univ., Aug., 1896, p. 15.

⁸⁴ Bul. No. 1, Man. Tr. Sch. Washington Univ., Aug., 1896, p. 12. The extent to which the school served as an institution preparatory to higher vocations is best known by a tabulation of graduate students.

⁸⁵ First found in catalogue, St. Louis Man. Tr. Sch., 1904-5. Continued to 1908-9.

⁸⁶ Woodward, C. M. A lecture in Boston (Dec. 16, 1885) quoted in Art and Industrial Education, Vol. II, 1892, p. 779. The first employment of the enigmatic phrase, "Put the whole boy to school," was at a complimentary dinner given to Prof. Woodward (Dec. 17, 1885). He was paraphrasing the words of Anna Garlin: "Let the child be taken to school whole instead of in parts." Cf. Rep. Commis. of Educ., 1893-94, Vol. I, p. 883, and Art. and Indus. Educ. in U. S., Vol. II, p. 779.

⁸⁷ The significance of this change in phraseology escapes me.

⁸⁸ It had occurred as early as the catalogue of 1908-9, but without No. 3 of the "Advantages."

Advantages.

1. It is a school for *boys* of high-school grade.
2. It is a school where boys come almost entirely under the influence of specially trained men.²⁰
3. It is a school where every boy is *graded* so that he is constantly in competition with his *peers*.²¹
4. It is a school where *every* boy receives instruction in academic branches as well as in draughting and shopwork.²²
5. It is a school where the shops and draughting rooms are *not only* thoroughly equipped, but also ably manned by instructors of *rare skill* and wide *experience*.
6. It is a school where there is a *sympathetic* coordination of academic and manual work.
7. It is a school with an attractive *campus* and beautiful and *inspiring* surroundings.
8. It is a school with an enthusiastic and *successful* body of *alumni*, and a tradition for *earnest* work.
9. It is a school to whose *training* a great number of men, without hesitation or exception, attribute the *foundation* of their success.
10. It is a school where the *whole* boy is developed.

Only one point raised by these formal pronouncements will be discussed, namely, the shifting attitude of Woodward in regard to the cultural purposes of the manual-training school. At first the school was expected to 'turn out "superintendents, foremen, and skilled workmen." To this expectation we may assign in large part the interest of Messrs. Conzelman, Harrison, and Cupples. The results, however, did not justify their expectations. The students who had enrolled with glowing hopes of future positions as shop superintendents failed to attain the anticipated degree of dexterity. "Shop superintendents" were said to be developed by the school in the early prospectuses and catalogues, but after the graduation of the first class the word disappears forever. Its place is taken by the oft-repeated declaration that the school did not intend to produce skilled mechanics. Something had happened; obviously the experiences of those who had left the school were responsible for the change.

A perhaps more powerful force moving for alteration in the purposes of the school was the nature of the students. From the very beginning more than half of the graduates went on to institutions of higher learning. The manual training school was a preparatory school and not a feeder for the open-shop industries. The perception of this fact brought about fundamental changes which in time were recorded in the "aims"; but these changes, far-reaching as they were, concerned only the program of the school and did not

²⁰ Note that this is not clearly distinguished from No. 5.

²¹ This "Appeal to emulation" as a motive for diligence is generally rejected by educators and is replaced by the effort to have the student compete against his past record.

²² This is essentially the same as No. 6.

in the least affect the educational creed of the founders. The foundations of the manual training school had been so broad that the shift was more violent than at first it appeared to be. As early as 1882, Woodward said in a letter to President Eliot:

It is my intention to improve every opportunity to declare that in educating the hand we do not neglect the mind; that our classifications are made on the basis of ordinary academic studies."

In 1889 he said once more:

The atmosphere of the shops is that of a school, where it is the sole business of an educated teacher to illustrate the principles of mechanics, to analyze tools and processes, and to give scientific explanations and instructions. Culture in intelligent and skillful planning and doing is the supreme object of the shop."

But up to that time, and even later, the cultural value of manual training had not been all-important, as it was in 1904, when on this last occasion he staked his whole case on this argument:

It seems to me that the highest efficiency can not be secured without culture, and that the best culture must be joined with efficiency. Therefore we aim at both culture and efficiency in recommending that practical drawing and the mechanic arts be placed side by side with the ordinary academic work."

It is interesting, therefore, to look back to the published aims of the school and to see how this changing emphasis is mirrored therein. The catalogue of 1894-95 declared that the wish of the school was "to lay a broad and appropriate foundation for a higher technical education." The new trend makes itself felt in 1908, when the word "technical" is dropped. The phrase, "to lay a broad and appropriate foundation for a higher education which is not exclusively classical," took its place. The claim for the universal efficacy of manual training is proclaimed in 1909, when we read that the aim of the school was, "to lay a broad and appropriate foundation for a higher education." The about-face is complete.

"Letter of C. M. Woodward to Chancellor W. G. Eliot, Feb. 27, 1882.

"Woodward, C. M., "What shall we do with our boys?" address before October meeting of St. Louis Railway Club, 1898, p. 12.

"Woodward, C. M., "A word of explanation," Nat. Educ. Assoc., St. Louis, 1904 (single-page leaflet); see also Rep. of U. S. Commis. of Educ., 1893-94, Vol. 1, p. 888.

Chapter V.

INFLUENCE OF THE MANUAL TRAINING SCHOOL OF WASHINGTON UNIVERSITY UPON AMERICAN EDUCATION.

In the foregoing chapters an attempt has been made to chronicle the important internal features of the St. Louis Manual Training School as a distinct and separate institution. The facts concerning it which probably most impress the student of the history of education are those pertaining to its influence upon American education. Forty years ago the democratic tendency in education was far less marked than it is to-day. The value of a classical education was still a tradition in many universities, and the existence of this tradition was one of the first hindrances with which the Manual Training School had to contend. The distinctions between the mechanics' institute, the manual labor school, and what was to become the Manual Training School should be borne in mind at this point. The history of these early forms of trade instruction, although of the greatest interest, is yet to be traced; there is, so far as known to the writer, no survey of the material available. But with these remoter antecedents of the manual training school there is no immediate concern beyond pointing out that the mechanics' institute and the manual labor school limited themselves in their choice of pupils to tradesmen and to indigent students, respectively.

The mechanics' institute sought to give further instruction to the apprentice and journeyman in the trade the men had chosen, a continuation school in a certain sense. The manual labor school, devoid of pedagogical theories, made use of the student's strength or skill in a craft to supplement his income and thus to enable him to pursue a more strictly academic school course.¹ Neither the mechanic's institute nor the manual labor school opened its doors to the sons of the well-to-do or of the professional classes. The manual training school, on the other hand, made available the crafts to those groups from which such instruction had been withheld.

In 1880 Europe was full of trade schools, and manual labor or "Fellenberg" schools were more or less common in this country;

¹ It is the intention to discuss the history of the manual labor schools at another time, and probably in another connection the development of the mechanic's institute.

but nowhere was there a manual training school of secondary grade. When Woodward opened the Manual Training School of Washington University, popularly known as the St. Louis Manual Training School, "he presented to the educational world a course of study absolutely new, entirely different from that of any other secondary school."² It was novel from the point of view of the secondary school teacher, who was traditionally familiar with the notion of mental discipline, because it introduced manual arts into the curriculum.

On the other hand, the mechanics' institute and the manual labor schools, well enough versed in the crafts themselves, were totally unacquainted with their supposed disciplinary value.³

Prophetlike, Woodward was early conscious of the importance of his project. "We stand," said he, in 1882, "upon the threshold of a new era in education, and it seems to be our mission to lead and to show the way."⁴ This acute observation truly foreshadowed what was to follow, for the St. Louis Manual Training School was destined to prove a center from which manual training spread to all parts of the country. For a decade it stood as an object lesson to the people of America and to the whole educational world.⁵ It is noteworthy that in formulating a lengthy reply to an inquiry of Chancellor Eliot, "in regard to his ideas as to our 'Manual training school' with a view to its further and best development," Woodward called attention (1882) to the cordial and emphatic approval the school's work had received on every hand. He had before him and quoted freely from press notices and personal correspondence. Frank Leslie's Illustrated Newspaper for May, 1881, reviewed at some length the progress of technical education in America: Altogether encouraging was the tone of an anonymous review of the work of the St. Louis school. In substance the article was an extract of an early manual training school catalogue, but in approving the work of the school the author declared on his own authority: "In this promising field of dual culture of head and hand considered

² Rathman, C. G., "The mission of manual training" (published address), St. Louis, June 13, 1909, p. 3.

³ It seems to me that Prof. James McKinney misses the point in his comments on Woodward's views. See James McKinney, "The what and why of manual training," Indus. Arts Mag. (8:283-97, Aug, 1919). He declares that Woodward and the early men were advocates of manual training because of the value of the tool process involved. It is significant, however, that manual training was defended by them on the same grounds as Latin or mathematics; in which cases, of course, no value was claimed for the process per se. The process was subsidiary to the notion of continuous mental discipline. The article is a convenient and interesting survey of the fluctuations in regard to manual training's justification from the standpoint of educational theory.

⁴ Letter of C. M. Woodward to Chancellor Wm. G. Eliot, Feb. 27, 1882. (Collection of Chas. E. Jones.)

⁵ Bull. No. 8, Man. Tr. Sch. Wash. Univ., Aug., 1899, p. 6.

as a matter of general, not special training, this school stands alone in our country, if not in the world."⁶

No wonder, then, that during the early years of the school a visit to it was part of every program of entertainment for distinguished visitors. Coleridge, Lord Chief Justice of England; ex-President Hayes, a prominent figure in the movement to establish the Toledo Manual Training School; President Porfirio Diaz, of Mexico; Prince Walkowski and Princess Schakoroski, of Russia; Matthew Arnold, of Rugby, and his wife; William Mather, royal commissioner of education for England; Members of Parliament and Members of Congress; school superintendents and commissioners, have recorded their names in the visitor's register. Its success early attracted the attention of Col. Augustus Jacobson and Charles H. Ham, of Chicago. At their earnest solicitation the members of the Commercial Club of Chicago visited the school in 1882. Upon their return home they decided to establish a similar one. Mr. E. W. Blatchford, president of the board of trustees of the Chicago Manual Training School, on the occasion of the laying of the cornerstone of the school building (Sept. 24, 1883), recognized the obligation:

Our indebtedness should be acknowledged for practical suggestions and valuable ideas to the St. Louis Manual Training School and its able director, C. M. Woodward. Opportunity was afforded for personal observation of this school by a visit of our club to the St. Louis Commercial Club in October of last year. Our own course will closely follow the curriculum prescribed by the St. Louis school.⁷

The work of the pioneer school was fully presented at the Saratoga meeting of the National Educational Association in 1882. Here for the first time there was an expression of general interest in the subject of manual training. From the discussions which followed Woodward's intelligent discussion of the aims and purposes of manual education (later published in *Popular Science Monthly*) "waves of interest swept back and forth across the country."⁸ But conditions were not yet ripe for the spread of the movement on anything like a grand scale. In 1883, however, the school authorities of Baltimore, "after careful investigation and due consideration of

⁶ Anon, *Technical Education*, Leslie's Illus. Newspaper, 52:226, May, 1881. Institutions antedating the St. Louis school are often spoken of, after 1879, as "manual training schools." "In 1848 there were reported in operation 16 manual training schools." Cf. Hallman, Wm. *Education of the Indian*, Monographs on Educ. in the U. S. (edited by N. M. Butler), St. Louis, 1904, p. 7; "I had the honor in 1865 to organize the practical exercises in the manual training school of Annapolis." Cf. Hawkins, J. T. *Discussion of a paper read by C. M. Woodward*, Art and Ind., Vol. IV, 1898, p. 47. But "as far as the official records of the Naval Academy go, no mention appears of a manual training school there at any time." Cf. Letter of Librarian A. N. Brown to Charles P. Coates, Sept. 9, 1921.

⁷ Extract from the remarks of E. W. Blatchford, president of board of trustees of Chicago Manual Training School, on the occasion of the laying of corner stone of the school building, Sept. 24, 1883. (Published in pamphlet form.)

⁸ Rep. U. S. Commis. of Educ., 1893-94, Vol. I, pp. 885-89.

the subject of introducing some form of training in industrial education-as an integral part of the public-school system of the city," decided to have a manual training school of high-school grade.

The subject was discussed in the public press and much interest awakened. Finally, Professor Woodward was invited to the city to deliver an address setting forth the plan, objects, methods, and success of the school under his charge. The address was delivered at the Johns Hopkins University to an audience comprising many of the city officials, the school board, and the active friends of education. President Gilman warmly indorsed the proposed movement. The address of Professor Woodward was listened to with great interest, and the proposed new departure in education was welcomed with enthusiasm.

On October 7, 1884, the Scott Manual Training School, of Toledo, Ohio, was opened. The influence of the St. Louis Manual Training School is apparent in the choice of the name, for at that early time "manual training school" was a new term, one which was obviously and unmistakably associated with the St. Louis project and which implied derivation from our school. The Scott Manual Training School, a curious foundation which, however, was under the control of the school board and the city authorities, in its very first year called on the St. Louis institution for a graduate to serve as teacher. This man, the first graduate to follow the profession of teaching manual arts, became later the superintendent of that school. In arranging the laboratory work for boys the methods of the St. Louis Manual Training School were closely followed.¹⁰

The influence of the St. Louis Manual Training School on the Cleveland Manual Training School appears to have been no less extensive:

The school was incorporated on June 2, 1885, for the purpose of "promoting education," and especially the establishment and maintenance of a school of manual training where pupils shall be taught the use of tools and materials, and instruction shall be given in mechanics, physics, chemistry, and mechanical drawing.

The organizer of the movement in Cleveland was Mr. Newton M. Anderson, who had already spent two or three days in St. Louis studying the methods of manual training.¹¹

Detailed reference to a greater number of early institutions whose projectors disclaimed any intention of establishing courses at variance with those of the pioneer school is impossible. Yet it is interesting to refer to its visitor's register and to compare the names of those who participated in the establishment of the early manual training schools with the autographs recorded there. Significant,

¹⁰ Rep. U. S. Commis. of Educ., 1893-94, Vol. I, p. 890. Clarke, I. E., Art and Indus. Educ. in U. S., Washington, 1892, Vol. II, pp. 357-58.

¹¹ Clarke, I. E., Art and Indus. Educ. in U. S., Washington, 1892, Vol. II, p. 407.

¹² Rep. Commis. of Educ., 1893-94, Vol. I, p. 893.

too, is the fact that it was to the St. Louis school that these men turned in their search for a faculty. The alumni roster for 1885-86 showed that the school had contributed teachers to the following cities: Toledo, Eau Claire, Omaha, and Denver.¹²

The year 1886-87 was characterized by great activity in educational centers in behalf of manual training. During this year, Woodward issued a book under the title, "The Manual Training School."¹³ This book, "intended to meet the wants of pupils, parents, teachers, and school managers," was widely read. While many of the author's prophecies have not stood the acid test of time,¹⁴ it would, nevertheless, be a mistake to minimize its importance; for it organized manual training as a teaching subject and thereby profoundly influenced its spread. It furnished what, during the early days of manual training, Woodward had hesitated to put in the hands of inexperienced teachers—complete sets of models and an exposition of their sequential use. In the early catalogues he declared that there was no peculiar merit in a specific set of models; that the main object of one or more exercises was to gain control and mastery of the tool in hand and not to emphasize the production of particular models; that "the *method* of doing a piece of work, and not the finished piece, was generally the object of a lesson."¹⁵ For this reason he persistently refused to give information about the exact nature of the shopwork.¹⁶ This refusal occurred in the catalogues for a period of a few years, after which his opinion seems to have changed, or at any rate his practice did. The influence of the publication of the actual series of models must have been very considerable. Once the models were available, as in the book of 1887, anyone with a modicum of technical skill could duplicate the work of the Manual Training School. The models were copied widely, particularly those for forging practice, and many are still in use. It would require an elaborate survey of the current practice in manual training to demonstrate the extent of this influence. Yet it will perhaps suffice to note that there exists no competing set, notwithstanding the fact that the Manual Training School models are now over 40 years old.

The exhibits of manual training work, the official publications of the school, the teachers sent out from it, the lectures of Woodward at home and abroad, and the records of the graduates spread the Russian theory of manual training.

¹² Catalogue, St. Louis Man. Tr. Sch., 1885-6, pp. 40-45.

¹³ Woodward, C. M., "The Manual Training School," Boston, 1887.

¹⁴ I have in mind his contention that manual training would eliminate a large per cent of withdrawals from school and increase attendance. See "The Present Status of Manual Training in the Public Schools of the United States," Frank W. Ballou in Man. Tr. Mag., Oct., 1907, Vol. IX, p. 23. A summary of views on the subject.

¹⁵ Catalogue, St. Louis Man. Tr. Sch., 1881-82, p. 27.

¹⁶ Prospectus, St. Louis Man. Tr. Sch., June, 1882, pp. 12-13.

The manual features of the school, as shown by its regular class exercises in drawing and tool work, were exhibited in other cities, as follows:

At the annual meeting of the National Educational Association: In Saratoga, N. Y., in 1882; in Saratoga, N. Y., in 1883; in Madison, Wis., in 1884; in Chicago, Ill., in 1884; in San Francisco, Calif., in 1888; in St. Paul, Minn., in 1890.

Partial exhibits were made: At Springfield, Fitchburg, and Worcester, Mass.; New York City and Albany, N. Y.; Columbus and Cincinnati, Ohio; Louisville, Ky.; De Funiack Springs, Fla.; Kansas City, Jefferson City, St. Joseph, and Hannibal, Mo.; Sioux Falls, S. Dak.; Altoona, Pa.; Dallas and Austin, Tex.; Evanston and Cairo, Ill.; Shreveport, La.; Wheeling, W. Va.; Bloomington, Ind.; and many other places where a keen interest was manifested.¹⁷

The value of the work done by the pioneer school has been recognized by four international juries, who have awarded gold medals at the international expositions of 1889 and 1900, and at the Columbian Exposition of 1893, and a grand prize at the Louisiana Purchase Exposition of 1904.

These exhibits showed the variety of tool work and drawing actually performed. They were arranged in sequential exercises.

Reports were distributed through various channels: At the larger exhibits attendants were instructed to forward the names of all visitors to the booths who manifested an interest in manual training work; to these, circulars of information and catalogues were sent. Traveling salesmen from the firms with which patrons of the school were connected were instructed to interest the smaller towns' people in the possibilities of manual training. Copies of the school's prospectus which had been carried to Europe by Samuel Cupples, William Huse, and Edwin Harrison were widely copied.¹⁸

Correspondence files of the school, which extend over a period of 30 years, bear witness that not a year passed without the director receiving a number of calls for young men to teach manual training. The pioneers in the introduction of manual training in the American public schools were graduates of the St. Louis Manual Training School.

No complete bibliography of Woodward's articles bearing on manual training exists. It is of course impossible to reconstruct his lecture tours, and the printed lecture or article is the only evidence now available of the fact that the influence of the school was spread in that way. No program of the National Educational Association during the late eighties and early nineties was considered complete without an address from him. No report adverse to manual training which appeared in educational journals passed unchallenged by him. "In season and out of season and in every educational center of the country, he preached and practically demonstrated the useful-

¹⁷ Catalogue St. Louis Man. Tr. Sch., 1897-98, p. 11; 1900-7, pp. 7-8.

¹⁸ Correspondence, Files of the St. Louis Man. Tr. Sch.

ness of manual training and its value as a factor in the making of men." So far-reaching was this influence that it often extended to copying word for word from the publications of the Manual Training School. The first catalogue of the Toledo Manual Training School was practically a reprint of an early catalogue prepared by Woodward.

When the founding of a manual training school in San Francisco was proposed the ordinance relating to the establishment of the St. Louis project was quoted almost entire. So familiar, indeed, was the writer with the words and phrases of Woodward that he borrowed such words and phrases as "In a manual training school everything is for the boy; he is the most important thing in the shop, the only thing to be put upon the market."¹⁹ During the last two decades of the nineteenth century Woodward was a very much interviewed man. He corresponded with European educators, and, as has already been pointed out, he accepted a formal invitation from William Mather, royal commissioner of education, to present the topic of manual training at an educational conference in England on September 14, 1885.

In Manchester he gave three public lectures upon the theory and methods of his own school, with such statements of results as the records would warrant. The subject was thoroughly canvassed by the managers of the Manchester Technical School, the result being that a manual training department with a complete curriculum was opened in September of that year. At that time the general educational value of manual training for pupils who might not become craftsmen was not recognized in any European school."

Probably the strongest argument to which Woodward resorted in his many pleas for the establishment of manual training schools was what he termed "the fruit of the tree;" that is to say, the record of his school's graduates. Manual's alumni in 1915 numbered 1,346, representing every State in the Union and several foreign countries. From the earliest days great interest has always been manifested in their record as affording material for an estimate of the value of manual training as a preparation for life. While only one with a warped perspective could agree with the St. Louis Manual Training School authorities "that as a consequence of their success manual training schools on public and private foundation have been established in every large city in the country,"²¹ nevertheless, through these graduates and more particularly the supervisors and teachers who early disseminated "the true theory of manual training," the influence of the institution has been plainly felt in the educational world.

¹⁹ Cf. Raymond, Wm. G., "A manual training school for San Francisco," *Overland Monthly*, 8: 113-119, Aug., 1886. Cf. also: Clarke, J. E., *Art and Indus. Educ. in U. S.*, Washington, 1892, Vol. II, p. 356; *ibid.*, pp. 23-24; Monroe, Paul., *Manual Training*, *Cyclopedia of Education*, 4: 125 (New York, 1913).

²⁰ *Rep. U. S. Commis. of Educ.*, 1893-94, Vol. I, pp. 893-94.

²¹ *Catalogue, St. Louis Man. Tr. Sch.*, 1903-4, p. 45.

APPENDIX.

AN ORDINANCE ESTABLISHING A MANUAL TRAINING SCHOOL IN THE POLYTECHNIC DEPARTMENT OF WASHINGTON UNIVERSITY.

ARTICLE I.

A special school for manual instruction is hereby established as a permanent branch or part of the polytechnic school, to be known as "The Manual Training School of Washington University."

ARTICLE II.

Its objects shall be instruction in mathematics, drawing, and the English branches of a high-school course, and instruction and practice in the use of tools. The tool instruction, as at present contemplated, shall include carpentry, wood-turning, pattern-making; iron clipping and filing; forge work, brazing and soldering, and the use of machine-shop tools, and such other instruction of a similar character as may be deemed advisable to add to the foregoing from time to time.

The students will divide their working hours, as nearly as possible, equally between mental and manual labor.

They shall be admitted, on examination, at not less than 14 years of age, and the course shall continue three years.

ARTICLE III.

Until further ordered, Messrs. Edwin Harrison, John T. Davis, and H. W. Elliot, in association with Messrs. Samuel Cupples and G. Conzelman, shall be, and the same are hereby constituted, "The Managing Committee" of the Manual Training School of the university, with authority to manage its affairs and report, from time to time, to the university board of directors.

All vacancies in said board shall be filled by the university board of directors.

ARTICLE IV.

The expenses of said school shall be provided for, as far as possible, by gifts and endowments specially contributed for the purpose, and all such gifts and endowments shall be held sacred and apart, and shall be used only for the direct purposes for which they may have been given, unless by consent of the respective donors or their legal representatives.

ARTICLE V.

For every sum of \$1,500 contributed for the establishment of permanent endowment of said school the donor shall be entitled to a certificate of scholarship, under which he shall have the right to send one scholar to said Manual

Training School free of tuition charges so long as said special school shall exist.

For every sum of \$75 subscribed and secured, to be paid annually toward the support of said school for a term of not less than five years, the subscriber shall be entitled to a certificate of scholarship, with the same right as above named, to continue in force for as many years of actual use as the said sum is annually paid.

In all cases such scholarships shall be known by the names of the persons who establish them, or by such name as they may designate.

ARTICLE VI.

Students in any department of the university to whom the privileges of said Manual Training School may be extended by the university board of directors shall receive instruction therein without extra charge for tuition, under such regulations as may from time to time be made by the managing committee.

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